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AUTHOR Mulligan, Kevin; Powell, Jerry
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ABSTRACT

Presented are recycling program alternatives, procedures for handling and marketing recyclable materials, and suggestions for financing and publicizing a recycling operation. This publication offers a general overview of the possibilities and potential pitfalls of recycling efforts, thereby serving as a catalyst and guide for organizations wishing to initiate recycling programs in their communities. Five chapters provide basic background information on: (1) markets; (2) models of operation; (3) handling, processing, equipment, and labor; (4) publicity and education; and (5) funding and business management. To demonstrate how the ideas and suggestions discussed can be put into operation, a case history of a Portland, Oregon recycling program is presented. In addition, a chapter on resources lists and briefly describes publications, films, and sources of information related to recycling. (WB)

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OPERATING A RECYCLING PROGRAM: A CITIZEN'S GUIDE

This guide (SW-770) was written by Kevin Mulligan and Jerry Powell of the Portland Recycling Team, Portland, Oregon, under EPA training grant T-90084901.

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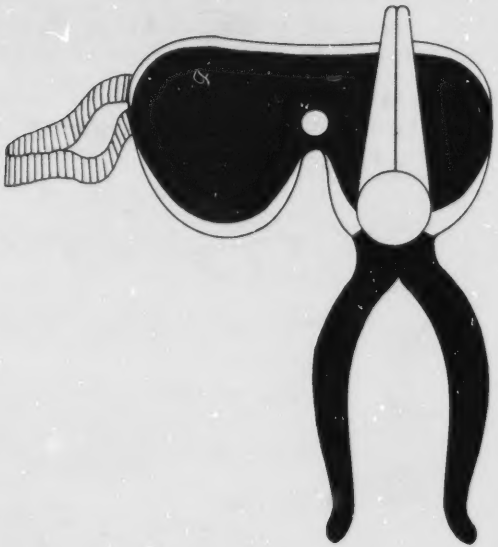
CONTENTS



Chapter		Page
	Introduction	6
I.	**Markets**	7
	Market Constraints	7
	Locating Markets for Recyclables	8
	Paper	8
	Glass Bottles and Jars	9
	Steel Cans	9
	Aluminum	10
	Contacting the Buyer	10
	Marketing Strategies	11
	Open Market Selling	11
	Contract Sales	12

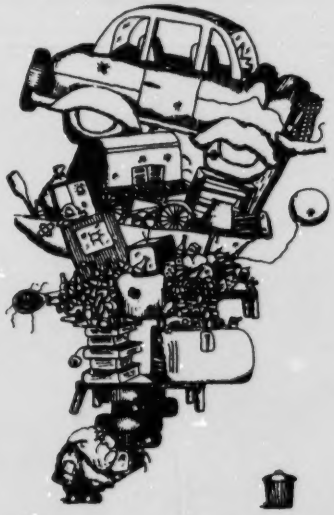
Chapter		Page
II.	**Models of Operation**	14
	Drop-off Centers	15
	Attended Drop-off Centers	16
	Unattended Drop-off Centers	17
	Periodic Projects	18
	On-call Collection	20
	Commercial Collections	21
	Buy-back Programs	23

Chapter		Page
III.	**Handling, Processing, Equipment & Labor**	24
	Project Site Selection	26
	Processing Requirements and Methods	29
	Newspaper	29
	Corrugated and Kraft Paper	30
	Mixed Scrap Paper	30
	Computer Cards & Paper	31
	High Grade Papers	31
	Metals	32
	Glass	32
	Collection and Storage Containers	35
	Steel and Fiber Barrels	35
	Bins and Nesting Containers	35
	Large Corrugated Cartons	36
	Self-dumping Hoppers	36
	Refuse Containers and Drop-boxes	36

Chapter		Page
	Trucks	37
	Standard Vans and Flatbeds	37
	Dump Trucks	37
	Additional Equipment	38
	Balers	38
	Glass Crushers	38
	Paper Shredders	38
	Paper Cutters	39
	Strapping Machines	39
	Can Flatteners and Magnetic Separators	39
	Fork Lift Trucks	39
	Conveyors	40
	Hand Trucks and Dollies	40
	Labor	40
IV.	**Publicity & Education**	43
	Newspapers	44
	The Press Release	46
	The News Conference	47
	Media Mailing Lists	48
	Timing a Press Release or Conference	48
	Newspapers and Magazines	49
	Radio Publicity	49
	Sample Public Service Announcements	50
	Television	51
	Speakers Bureau	51
	School Programs	52
	Public Displays	53
	Newsletters	54
	Other	54
	Last Words on Publicity	56

Chapter		Page
V.	**Funding and Business**	57
	Types of Organization	57
	Single Proprietorship	57
	Partnership	57
	Corporation	58
	Non-profit Corporation	58
	Business and Legal Requirements	60
	Loans	63
	Grants	65
	Fundraisers	69
VI.	**The Proof It Can Be Done: History of the Portland Recycling Team**	70
VII.	**Additional Resources**	84
	Information Resources	87
VIII.	**Glossary**	88

"Somerville Saves" Poster



INTRODUCTION

That you secured a copy of this booklet indicates you are aware of and concerned about a national problem—our ever-dwindling resources—and you are considering ridding a portion of the American public of its "throw away mentality." Congratulations!

Recycling programs can be and have been successful. Those which have oftentimes proven the most beneficial to the public and have been responsible for recycling the largest volumes of materials have succeeded because of organization members' determination and willingness to implement any of a number of recycling options available to them as the need and opportunities arose.

In the following pages of this guide you will discover an assortment of recycling program alternatives, an assortment of procedures for handling and marketing recyclables, and suggestions for financing and publicizing the program you choose to develop. By no means is this booklet able to discuss any of these topics in depth. Its intent, rather, is to give you solid information at your project's outset, to give you encouragement and advise of possible pitfalls, and to provide you with names of organizations which will be of further use to you as new circumstances present themselves.

I. MARKETS

CONSTRAINTS

The U.S. EPA recommends that the first activity of a new community recycling program be to determine and locate the area's available markets for recyclable materials. The program may then be planned according to what materials these markets will and will not buy. In other words, the market situation determines what will be recycled and how it will be recycled.

The importance of securing markets for processed materials is heightened by the unique nature of many recycled materials markets. As a general rule, recycling growth is limited by **demand** rather than by supply. As the long-used adage from the salvage industry indicates, "Scrap is not sold, it is bought." So, because of their dependence on the wider economy, waste materials markets are volatile; a gentle ripple in the national economy may generate severe waves through the recycling marketplace, forcing buyers to purchase only what they are confident they can sell.

In addition to waste materials markets' dependence on existing conditions of the economy, other factors inhibit their growth and fail to foster their stability. While a full review of these market barriers is beyond the scope of this manual, a listing includes:

- The lack of tax incentives for secondary materials use in comparison to advantages accorded to virgin resource consuming industries.
- the general slowness of industry to research the economic feasibility and to develop methods of incorporating recyclable materials into their plant operations.
- the disinterest by government to procure products containing reclaimed materials.

LOCATING MARKETS

PAPER Most wastepaper is used by mills that produce newsprint, stationery and book papers, towels, tissue, napkins, insulation, roofing paper, boxboard, paperboard, and wallboard. The value of wastepaper is determined by its category and grade, with top quality ratings given to materials containing the longest paper fibers and the least contamination. (Contamination is measured in terms of two variables: 1) the percentage of the paper's **prohibitive** materials or its unusable components such as carbon papers, rubber bands, staples and organics, and 2) the percentage of **outthrows**—that paper unsuitable for consumption at the grade specified.)

Generally, recycling program operators sell their wastepaper to paper stock dealers and processors who grade and prepare paper for shipment, and to paper brokers who buy and sell wastepaper as a usable commodity. On occasion they are also able to sell to final users such as mills and manufacturers.

Listings of potential paper buyers can be found in newspaper want ads and in the yellow pages of the telephone book under "Waste Paper" or "Recycling Centers." Most of these dealers and brokers purchase on a regional basis so if you are located in a small community, contact buyers in nearby larger cities. The following institutes may also provide dealer information:

- Paper Stock Conservation Committee
  American Paper Institute
  260 Madison Avenue
  New York, NY 10016

- Paper Stock Institute of America
  330 Madison Avenue
  New York, NY 10017

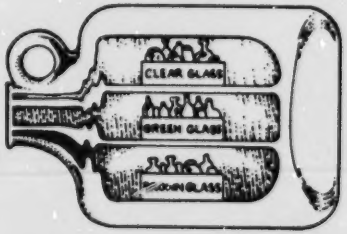
Note: As a paper recycler it would be to your benefit to obtain a copy of the Paper Stock Institute of America's brochure "Paper Stock Standards and Practices, Circular PS-77."

GLASS BOTTLES AND JARS As a rule, most recycling center programs market their cullet to the final user which is generally a bottle manufacturing plant. Although some recycling projects have found other cullet buyers such as glass bead, asphalt, flat glass, and refractory brick producers, or else market their material to commercial cullet processors, most recycling centers sell cullet under standard price arrangements provided by local bottle manufacturing plants. Processing requirements for this glass, which may include color sorting and metals removal, vary from plant to plant. When higher prices are offered for color sorted than they are for mixed or uncontaminated cullet, you may wish to plan your processing techniques accordingly.

To locate the nearest glass bottle manufacturing plant accepting cullet near you, contact the Glass Packaging Institute, 1800 K St., N.W., Washington, D.C., 20006.

STEEL CANS The majority of waste coated steel and bi-metal cans are sold to de-tinning plants and copper ore precipitation facilities and prices vary considerably from plant to plant. We urge you to research scrap can markets carefully before accumulating any large volume of cans.

Information about potential buyers and their material preparation requirements may be acquired from The Can People, 110 E. 59th Street, New York, N.Y., 10022. You might also contact scrap metal buyers listed in the telephone book under "Scrap" or "Junk Dealers."



ALUMINUM The reclamation and marketing of waste aluminum items may be a high income component for your program due to market demands for aluminum scrap. Besides checking the telephone book, you may get market information from the following sources:

- Your state solid waste management agency
- Recycling program operators in your area
- EPA Publication SW-518, "Market Locations for Recovered Materials"
- The Aluminum Association
  818 Connecticut Avenue, N.W.
  Washington, D.C. 20006

CONTACTING THE BUYER

The initial inquiry to a potential buyer should not be a simple "How much do you pay?" You should ask a number of other questions such as:

- When are we paid? Upon delivery? Weekly? Monthly?
- How are we paid? By cash or by check?
- Do you provide containers and/or transportation?
- How much contamination of material is acceptable?
- What processing and preparation are required? What additional processing and preparation would increase the marketability of the material?
- Is there a minimum quantity standard?
- Is there a maximum quantity standard?

- Do prices increase after delivery of a specific minimum tonnage?
- Are there hours set aside especially for delivery?

The answers to these questions will guide you in developing your program. While one buyer may offer a better price per ton, the lack of special preparation requirements or the availability of free transportation from your center to the buyer's site may attract you to a second buyer. Top dollar is not necessarily top deal.

A note of caution is needed here. Many recycling projects have failed because their operators did not institute marketing, sales, and income controls. While negotiating and trading with secondary materials buyers, be sure to keep clear written records. You should not jeopardize your program's success with lazy business practices.

As a general rule, open market sales and contractual agreements are the two major marketing arrangements implemented.

OPEN MARKET Unfortunately, growth in the number of buyers of recycled materials has not kept pace with the interest in recycling. The potential recycling program organizer may find limited marketing opportunities for certain reclaimable materials. The market shortage may be particularly true for glass bottles and steel cans. The recycling group can find itself at the mercy of a single buyer.

Another potential limitation for the recycling center's organizer in terms of price negotiation opportunities is the fact that certain buyers use an industry-wide pricing structure, particularly for glass bottles and aluminum cans. The recycling group may find two aluminum can buyers with the same 20 cent per pound price and two glass bottle plants with $30 per ton cullet prices.

Where more than one independent buyer does exist, open market arrangements have both advantages and limitations. Reliance on the open market requires a stable condition. The recycling program operator needs to gauge carefully the depth and reliability of a particular market situation. What has the range of prices been in the recent past? How many potential buyers are available? How long have they been in continuous business?

Given market stability, an open sales strategy can allow a group to achieve higher prices due to the flexibility of the marketplace. In addition, it allows for the switch of buyers in the case of deteriorating relationships or inadequate service. But open market trading does require managerial control, and lack of stability must be accepted. Realization of top prices during the best of times must be balanced against recognition of potential high losses during market weakness.

CONTRACT SALES As presented above, the issue is basic: should you trade off the possible high profits of the open market against the possible catastrophe of declining demand by marketing under a contract? Contract sales will likely mean lower prices during a high market but better prices during a low market. For the recycling group desiring stability over income, three contractual arrangements should be considered:

1. **Fixed price** agreements involve a predetermined price relationship between buyer and seller. As a rule, these arrangements are short-term.
2. **Floating price** arrangements provide for protection to the buyer and the seller by tying them both to changes in the market. These agreements are longer in term than fixed price contracts and they may call for

occasional review and adjustment. The price is pegged as a percentage of a published market quotation. Several California recycling programs, for instance, receive 72 percent of the published **Official Board Markets** price for newspapers for that region. (This magazine is published weekly by Magazines for Industry, 20 N. Wacker Drive, Chicago, Illinois, 60606, and is widely employed to establish the base for floating prices for wastepaper.)

3. A variation of the above contractual stategies is the **floor/escalator** pricing structure. With this plan the buyer offers a floor price below which the sales figure will not fall during the contract period. In addition, the buyer includes an escalator price clause in the agreement which is similar to the floating price arrangement described above.

Typical contracts include minimum tonnage requirements with a penalty clause for lack of specific volume, the period of the agreement, purchase specifications, and the pricing structure.

Advantages of the contract market structure include the guaranteed pricing system plus the likelihood of higher quality service from the buyer in the forms of technical advice, handling equipment, and storage containers. On the other hand, the inflexible nature of the agreement may create severe pressures during high market conditions. Since most recyclers are not trained or skilled in the art of market negotiations., the EPA strongly recommends that recyclers seek contracts for materials whenever possible.

II. MODELS OF OPERATION

Just as the recycling materials market determines what you can recycle in your area, so also does your group's particular circumstances—time, money and labor resources—play a role in determining a suitable model of operation. You will no doubt discover, if you have not already done so, that there are a number of plans from which you may choose. It is possible that the more information you gather on these options, the more confused you will become when attempting to determine their pros and cons.

To save you time and frustration, and to aid in the selection of a program which best meets your group's needs, we have provided the following section. It gives you a brief discussion of each of those recycling plans most commonly implemented—attended and unattended drop-off centers, on-call collections, commercial accounts, and buy-back programs—and each workable option is followed up with a list of its time, money and convenience—related advantages and drawbacks. If your community is interested in recycling collection systems, the resources section at the end of this manual describes various documents which would be helpful in organizing a recycling collection program.

DROP-OFF CENTERS

If you are considering a drop-off center program, the number of recyclable materials you process will determine the center's size and structure. If you plan to accept a great number of recyclable items, you will need not only considerable space, but also a number of bins, barrels, and boxes for collection and storage. Few items, of course, dictate the need for fewer and/or smaller containers and less space.

While volume determines the amount of storage and collection space you will require, you will most likely need a minimum of 1500 square feet (a building, or a building and lot combination of 30 × 50 feet). But if you plan to provide parking and driveway space for several trucks and cars in addition to collection and storage facilities, you will need a center with at least 5000 square feet (a lot 100 × 50 feet).

ADVANTAGES OF DROP-OFF CENTERS OVER OTHER MODELS OF OPERATION

- Possible 24-hour access.
- You do not have to provide the public with pick-up service.

DISADVANTAGES OF DROP-OFF CENTERS COMPARED WITH OTHER OPERATIONS

- Higher inconvenience level for public as it must travel to the center to drop off goods.
- Possible noise and traffic congestion.
- Vandalism may occur after dark and/or when center is unattended. Steps must be taken to prevent crime, for as the value of recyclable materials increases, so does the rate of theft.

Attended Drop Off Centers Major costs associated with the attended drop-off centers are rent, equipment, staff wages, and insurance for both workers and the public in case injury occurs while materials are delivered and handled.

The equipment you will need depends on the size and nature of your program (See Equipment and Handling Section). However, you can develop and outfit your center for as little as a few hundred dollars, or you can spend more than ten thousand dollars, depending on site and facility requirements as well as your financial resources.

Rental costs for your center will also vary according to its size and the rental rates of the area in which you decide to locate. It should be noted that many programs have been successful in obtaining free space for their centers; local governments, universities, and business community members with property to rent have been known to be very supportive.

Advantages of Attended Drop-Off Centers

- Paid personnel are available to give proper attention to materials, making sure that high quality, uncontaminated materials go to their buyers.
- Education programs can be available to the public.

Disadvantages

- Staff attendant salary and related costs will be considerable.

Unattended Drop-Off Centers Unattended depots ordinarily offer many of the same services as attended centers with the important exception of the absence of a paid attendant. An unattended depot can accept a full line of materials, or it can be a single materials drop-off. Many social service organizations such as the Lions and Kiwanis clubs utilize unattended recycling centers for their fund raising projects because the minimal management requirements and costs of operation offer greater money making potential. Usually these centers offer 24 hour a day access, though they may be operated on fixed schedules if they are located at sites with limited access such as churches or schools.

Because an attendant is not available, it is important to use collection bins and boxes that have been carefully constructed. They must be strong enough to take abuse which comes from unsupervised use. Such bins must also be larger than those of attended stations because material pick-ups will most likely be once or twice weekly rather than on a daily basis as there would not be paid personnel readily available.

Advantages of Unattended Drop-Off Centers

- Little or no labor costs or volunteer management considerations.

Disadvantages

- No attendant available to assist public.
- Increased chance of receiving trash and other unwanted materials.
- Small amounts of materials are usually collected.
- Reduced opportunity for on-site educational activities.

PERIODIC PROJECTS

If your recycling group has limited time and money, or if you would like to initiate a program in a small community which has not offered recycling services before, the periodic project may be the best way to get started.

Such a project can be operated independently of, or in conjunction with a full-time recycling program. Many such periodic projects have arranged to share both responsibility and income with a full-time organization or secondary materials broker that takes charge of trucking, marketing, and bookkeeping duties while the periodic project sponsor is responsible for publicity and for providing volunteer workers on the designated project day.

Periodic projects usually operate on a non-profit basis, and handle a full line of recyclable materials, but they can be profit oriented; they can deal with only one or two materials. As usual, market conditions are deciding factors.

Many projects of this type have characteristics similar to full-time, attended centers with staff attendants available to help customers unload materials and to instruct them in proper preparation of recyclable items.

Most periodic programs are organized to collect, process, transfer, and market materials in a single day so a large truck or van usually serves as a mobile depot, eliminating the need for a permanent site. These projects also avoid many processing and handling problems as most processing occurs as the public delivers.

Periodic project costs are minimal. You do not have to pay rent for a permanent site, labor is usually donated, and trucking costs are low. Many programs have been able to use trucks or transport bins that have been loaned or donated. Others rent their vehicles on the project day and pay rental fees from receipts for the sale of materials. The site for the project, usually a shopping center, school, or church

parking lot, is oftentimes donated or rented at a nominal fee.

Operating only a few hours each month, a periodic project must be well organized and well publicized in order to be successful. When the public takes the time to separate and store materials for a month or longer, there is nothing that will cool its enthusiasm more than to discover you are not available at the designated time and day.

"Recycling Is A Blast!"

Advantages of Periodic Projects

- Minimal starting and operating costs.
- Attendants are available to provide assistance and education so instances of poorly prepared and non-recyclable materials are minimized.
- There are fewer opportunities for unsightliness

Disadvantages

- Only people with transportation can participate.
- Customers must have adequate storage space to collect their materials between project days.
- Limited opportunities to upgrade materials through additional processing are available.

ON-CALL COLLECTION

Another type of collection program offered by recyclers is the on-call collection. This usually involves one-time-only collection from people who have generated especially large volumes of materials, or it provides periodic service for shut-ins, the handicapped, or the elderly who are unable to deliver their materials to the center or depot. On-call systems are most often small and low-key and are offered as a community service rather than as a full-time, economically viable program. They present the opportunity for a highly visible public service contribution to your community and may provide public relations benefits well beyond the inconvenience and financial considerations they require.

Advantages of On-Call Collection

- On-call collection provides the same general advantages as a scheduled collection route.
- A highly visible public service is offered.
- The system can be offered without major financial costs.

Disadvantages

- A vehicle and driver are necessary.
- Small volumes and dispersed clientele may make on-call collection prohibitive to programs with limited resources.

COMMERCIAL COLLECTIONS

Commercial accounts are those arranged with local merchants and other major generators of such recyclables as paper, glass and corrugated paper. Taverns, restaurants, university dining halls and hospitals can be important suppliers of glass. Banks, insurance companies, law firms, and print shops are major producers of high-grade paper. Corrugated paper can often be secured from book and record shops, grocery stores, warehouses, and manufacturing establishments.

Ordinarily collections from these accounts, which can serve as the financial backbone of a recycling program by providing a stable flow of materials and guaranteeing income that overcomes volume fluctuations from other sources, are made on a regular basis. But contracts may specify either purchase of recyclable materials at a certain price with collection on a regularly scheduled day or they may specify on-call collection from offices and stores willing to give away materials in order to reduce their overall disposal costs. Though some commercial accounts may not generate large quantities of materials, they can help advertise your presence and create support for your activities within the business community.

Commercial programs require a high degree of dedication and professionalism. Contracts must be negotiated and written, and collection, storage and preparation arrangments must be firm and schedules rigorously maintained. Considerable expense may also be involved, particularly if you need special collection bins or desk top sorting units, and finally, intensive education campaigns and materials are necessary when you enter into a commercial program so that you may be assured that only recyclable materials are collected, that they are free of contaminants, and that all employees of your commercial customers know how and why to save and prepare materials.

The need to acquire equipment to perform commercial collections should be noted. Acquisition of a self-dumping or a compacting truck for corrugated paper recycling can cost from $4,000 to $20,000. A contract with a bank for office paper recycling may require the acquisition of desk-top sorters, costing from $1.50 to $4.00 per employee. Careful planning is required in undertaking recycling systems for commercial accounts.

Advantages of Commercial Accounts

- A regular source of materials and income is available.
- Uncontaminated and properly prepared materials are received.
- High volumes of materials can be reclaimed.

Disadvantages

- Contract negotiations may be required.
- Reliable transportation and labor are necessary.
- Finances may be required to provide special collection bins and containers.

Note: For more information on high grade paper collection programs, see "Office Paper Recovery: An Implementation Manual." EPA publication SW 571c.

BUY-BACK PROGRAMS

As the value of secondary materials increases and becomes known to the public, more recycling programs are being organized along the lines of a traditional business which buys recyclable materials from the public, then sells them to a materials user or processor. "Buy-back" programs, as they are called, usually purchase recyclable materials of highest value, such as glass, aluminum, and newsprint, but may also accept less profitable items such as mixed waste paper, motor oil, and steel cans. Naturally, market conditions in your area will determine what materials can be handled on a purchase basis, and whether your program will be profit or non-profit in nature. A buy-back program can be organized along the lines of any of the non-purchase services described above except unattended centers.

Buy-back programs are working successfully in many areas across the nation and can be positive incentives to public involvement in recycling. Such programs do, however, take considerably more financial resources, labor requirements, bookkeeping and management needs, and site locations. For instance, the need to carefully weigh small quantities of materials, to compute their value, and to provide payment for the materials requires scales, calculators, cash registers, and safes. To undertake these and other tasks requires a trained, full-time staff. For these reasons market conditions in some areas are such that a buy-back program would not be viable. In addition, in many communities there are major aluminum manufacturers which offer highly publicized and large scale aluminum recovery programs with which small recyclers cannot compete.

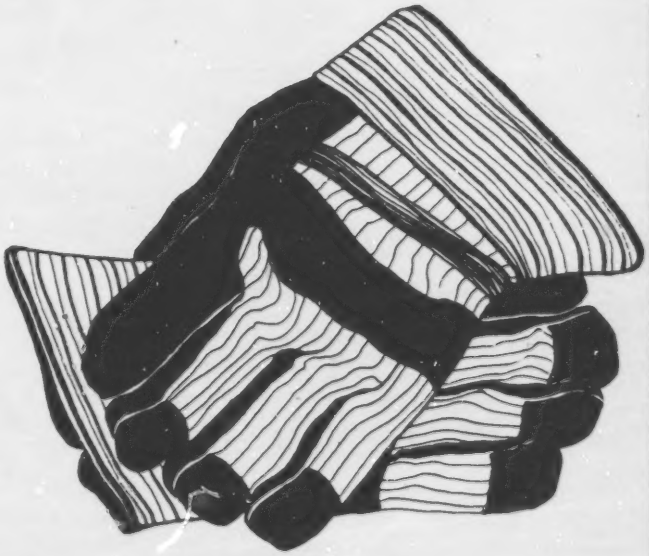
III. HANDLING, PROCESSING,

Advantages of Buy-Back Programs

- High quality and uncontaminated materials are received.
- A full-line of services and education programs can be offered.
- You do not have to provide collection services.
- Large volumes of materials are generally collected.

Disadvantages

- Considerable financing, labor and management are required.
- Competition with other programs in your area may limit the chances of success.
- Emphasis on recycling for monetary rewards may limit the opportunities to expand recycling and waste reduction programs.



EQUIPMENT & LABOR

No matter what type of program you choose to offer, you will have to decide early in your planning where you are going to operate, how you are going to handle your materials, and what equipment and labor resources you will need to do the job.

The size and scope of your program, availability of markets, and processing requirements of those markets will help determine the type of handling and processing equipment you need, forms of transportation to markets, and amount of labor required. These are important and lasting considerations, so you should take time and effort in your research and planning to determine what your needs are and how you are going to obtain the resources to meet them. (See Marketing and Models of Operation Sections.)

There are several handling "methods" from which to choose, ranging from low technology, labor intensive systems which use hand processing techniques with a minimum of equipment, to high technology, capital intensive systems featuring modern processing machinery and employing several types of material collection containers and trucks.

Most beginning recycling programs have used the availability and performance capabilities of free or donated equipment and locations to determine how and where they would collect and handle their recyclables. For instance, if your program is lacking in finances and a small pick-up truck is the only transportation you have available, you should consider using light weight and easily transportable bins and barrels and supporting equipment (such as hand trucks and ramps) which fit your truck. However, if you are able to obtain a roll-off truck you may want to seek the additional funding for the purchase of containers to fit your truck and perhaps use crushers and other processing equipment compatible with this type of container system. Or, if you are able to locate one or two large drop boxes to use for collection and storage, you may want

to investigate the cost of having these containers transported by a local hauler; if your markets are nearby, the money you save in handling and storage may offset the cost of transportation.

Remember, flexibility is one of the most important qualities of a recycling program. No single handling or transportation system is "the best," and many different methods and systems are successfully being employed by recyclers throughout the country. Most community recycling programs have started out small and under-equipped and have added equipment—including trucks and processing machinery—as they gain experience, increase their volumes, and achieve some financial stability.

This section will look at various factors affecting the handling, processing, and transporting of recyclable materials. These include project locations, processing requirements and methods, collection containers, trucks, other equipment, and labor.

In selecting a location for your center or program headquarters, the main features you should look for are easy and convenient access for the public; adequate collection, storage, and processing space; and low fixed and overhead expenses.

While it is certainly desirable to be able to afford a site at your chosen location and of your own design, very few recyclers have been this fortunate. Instead, most recyclers have had to find and take whatever locations were available to them, then remodel to fit their needs. Programs have been successfully operated from empty gas stations, commercial storefronts, warehouses, empty lots, fenced areas at local landfills, and even barns. Sizes range from a few hundred square feet with virtually no space for processing or education functions, to large and ambitious projects using thousands of square feet of warehouse space, complete with processing areas, office facilities, and extensive education centers.

The size and physical design of a center should be adequate to handle the processing you intend to do with plenty of room for truck access and parking. If you plan to use large roll-off containers or drop boxes, be sure that your site is large enough to allow trucks room to manuever, and to provide access for pickup and delivery. If you are going to transport and move materials by hand (rather than with a fork lift or other mechanical aide), you should look for a warehouse or other facility which has a loading dock or ramp.

Space must be suitable for all of the processing and educational functions you intend to offer. If you plan to break glass with an automatic glass crusher or have a large shredding and baling operation for your paper products, a corner gas station or commercial store front would not be suitable. Conversely, if you intend to offer limited services for one or two materials with little or no processing, a warehouse location, complete with loading dock and truck bays, would be unduly excessive and expensive. Determine what you want to recycle and how, then allow all of your site, processing, equipment, and trucking decisions to be determined accordingly.

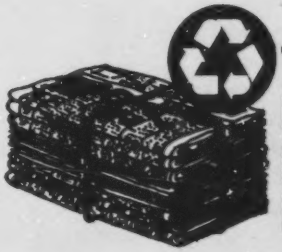
The site should be surfaced so as to withstand considerable weight and abuse. A 55 gallon drum of crushed cullet can weigh between 600 and 700 pounds so the surface should be concrete or asphalt paving sufficient to carry this weight. There should also be a covered area which can be used for processing and storage of papers and other materials which should be kept dry. If possible, the covered area should be large enough so that customers can deliver and unload their materials without getting wet.

The public must be able to find your center easily, recognize it upon arrival, and have ready access to your bins and barrels. While it would be convenient for the public if you could locate central to residential neighborhoods, zoning ordinances, business licenses

and permits may make this impossible. Most drop-off centers are centrally located in such areas as school yards, shopping center parking lots, large housing complexes, and church basements, as well as other public areas. Signs informing the public of how and where to separate their materials will also be needed.

An attractive and well kept center is important for the public. It may well be an asset to the neighborhood if you remember to allocate money for paint, fencing materials, and other supplies to clean and restore the site. The extra effort employed to paint and fence the site go a long way in gaining public appeal which will encourage teachers, school children, scout troops, and others to take advantage of the educational portion of your program. On the other hand, an unappealing recycling site—an eyesore—is bad advertising, and the fencing mentioned above is an absolute must if you want to be considered something other than a public nuisance. Blowing "trash" moving beyond confines of your lot has negative connotations. Fencing also serves to define your space and to prevent theft and vandalism.

Finally, if you are going to use your center as operation headquarters, you will need a telephone and publicized office hours, as well as office space for records, bookkeeping, and other administrative duties.



This Newspaper Is Needed for Recycling

PROCESSING REQUIREMENTS & METHODS

It is essential that your materials be processed into a form which is acceptable to your buyers. Rejection of a truck load of materials by a broker would be a setback, in terms of morale as well as in the labor you would need to dispose of these materials in another manner—usually at the local landfill.

Following are market specifications for collection, preparing, and processing materials for recycling — and some ideas about systems and equipment.

NEWSPAPER is perhaps the easiest material to prepare for marketing. For a typical recycling program, newspaper should be delivered to your center or depot bundled with string in 12 to 18 inch stacks and free of other papers such as magazines, phone books, scrap papers, and Sunday magazine supplements. Newspaper and all other paper products should be kept dry and you should arrange for their storage in an area free from fire danger. You can collect newspaper in any type of container which is available: industrial laundry carts, drop boxes, wooden bins. Or, you can simply stack it on flat dry ground.

Many paper brokers will provide large trailers or drop boxes for your use, so check with your buyer before you invest in any collection containers for papers. Large trailers or drop boxes are very convenient for the collection of paper products because they minimize handling and transportation. Your customers simply toss their papers into the container. When it is filled, you call the broker to arrange pickup.

You should instruct your customers to bring their newspapers to your center or depot already tied in bundles, if required, but you should also provide string and scissors for those who haven't properly prepared their paper.

CORRUGATED AND KRAFT PAPERS must also be free of contaminants—including other papers such as waxed or tar lined papers, magazines, or newspaper. Many times kraft paper, which is what paper bags are made of, and corrugated, which is essentially cardboard box material, can be recycled together, but you should ask your broker to review your planned instructions to the public. Corrugated boxes should be broken down flat and can be hauled to market either loose, in bundles, or in tightly compressed bales.

Almost any type of container is suitable for collecting and handling corrugated and kraft, but laundry bins or boxes with rollers seem to work best as they are lightweight and can be moved wherever you need them. Heavy twine or small bundling machines with strapping devices can be used to bundle these materials for easy handling. Commercial baling machines are also available and many brokers can provide these machines to you either on a loan or rental basis.

MIXED SCRAP is not highly marketable or profitable, nor does it usually require special processing or preparation. Therefore, if you decide to accept this material you should design a collection system which minimizes handling and transportation time. Drop boxes or large trailers work best, as customers can place their mixed scrap directly into the container and you can then deliver it to the broker. Other containers such as laundry carts or barrels work quite well to collect and store such scrap, but also substantially increase the handling time and work load for your workers.

COMPUTER CARDS AND PAPER, AND HIGH GRADE PAPERS require a large degree of quality control and **must** be free of contaminants. There are several classes and types of high grade paper and your broker will want these separated. Therefore, a high grade paper recycling program will likely require a great amount of monitoring and separation; however, the high price paid for these materials usually justifies the additional handling. Work with your broker to find out what grades of paper they purchase. There are several tests which can be conducted to determine paper grades and most brokers will be glad to demonstrate these tests for you.

High grade paper can be collected in any container which you have available. Ordinarily, you will not receive large volumes of this material unless you are offering an office collection program in which case you may have to provide special collection and storage containers for account customers. Many times the

baling of high grade papers will bring a considerable price increase, so check with your broker.

METALS including aluminum, steel cans, bi-metal cans, and other household items must be completely separated from one another, and therefore may require considerable preparation and processing. Some brokers even require that aluminum cans be kept separate from other aluminum products such as pie tins and foil, so check with your buyers before establishing your collection and handling methods for metals.

Cans should be free of food contaminants and crushed or flattened to reduce their volume (which, of course, allows you to handle greater tonnage with a minimum of storage containers). Paper labels should also be removed; they can then be recycled with your scrap or mixed papers. Preparation should be done by the public at home as it is a time consuming job once the materials are at the recycling center.

Separate bins or barrels should be provided at the recycling center or depot so that customers can readily separate their materials themselves. A magnet should also be provided so the customer can determine if a can is aluminum, steel, or bi-metal. Aluminum is not magnetic. Again, almost any size or type of storage container will do, depending on your expected volume and frequency of market delivery.

GLASS is the most difficult material to handle as it usually must be separated by color (green, brown, and clear) and usually all of the metal caps and rings must be removed. Window, baking, and windshield glass are not normally accepted. Glass should be brought to the recycling center or depot unbroken to make it safer for your workers as they crush the bottles into cullet. Paper labels usually need not be removed. Check with your buyers on purchase and preparation requirements before you announce to the

public what you will accept and how it should be prepared.

You should encourage your customers to remove metal caps and rings themselves. Not all of them will comply, so you should be prepared to remove these materials themselves. Long nose pliers or puncture-type can openers work best.

Once the glass has been sorted by color and the rings and other metals have been removed, it should be crushed into cullet for efficient handling and transporting. You will need some type of heavy metal container to store the cullet; large 20 and 40 cubic yard containers or drop boxes, or 55 gallon metal barrels are the most common methods for cullet handling. A roll-off container is the most efficient, as it will hold up to 10 tons of crushed cullet and you can deliver the entire container to market. Recyclers most commonly use 55 gallon barrels, but considerably more work and handling is required to load such barrels on

and off your trucks. If you use barrels you will need a hand truck, dolly, or fork lift to lift these barrels and move them around.

There are several methods of converting uncrushed glass to cullet. The most common method is to use a sledge hammer inserted through a hole in a lid over the 55 gallon barrel. Simply place the glass in the barrel and smash the glass with the hammer. The lid will prevent the glass from flying out of the barrel. Other recyclers have found it just as easy and efficient to throw one jar onto another, breaking one glass bottle against another as they proceed.

Several types of mechanical glass crushers are available. Though they are not generally too expensive, fairly large volumes are required to justify the purchase of a machine designed to crush several tons per hour. If you are receiving large volumes of glass, or are offering a commercial program in glass, a machine may be a very valuable addition to your operation.

Whatever method you choose to employ to handle, crush, and transport your glass, you must be extremely careful and safety conscious. You should require that glass be crushed in a specially designated area, and that staff and volunteers wear protective clothing, gloves, safety glasses, and ear plugs when they are working with glass. And you should keep a first aid kit handy.

MOTOR OIL, COOKING GREASE, PLASTICS, CAR BATTERIES, SCRAP METALS, AND OTHER RECYCLABLE MATERIALS have varying handling and processing requirements. You should check with your brokers and local markets before you accept or attempt to market any of these materials.

COLLECTION & STORAGE CONTAINERS

Ideally, you should try to collect and store your materials in the same containers which you will use to deliver them to market. This will limit the amount of handling you will have to do, greatly increase the efficiency of your program, and reduce expenditures for additional receptacles.

STEEL OR FIBER BARRELS can be used to collect and store glass, metals, and most of your paper products. They generally come in 20 to 55 gallon sizes and are easy to handle and transport. Used or slightly damaged barrels can often be bought cheaply ($1-$3 each) or obtained by donation from local manufacturers, oil and chemical companies, and paint supply houses.

If you use barrels of this type you will need a hand truck or a fork lift truck to move them around and load them for transport. Barrels can be rolled on their bottom edges if they are not completely filled, but if you do not have a fork lift you will need a truck with a rear lift gate to load and unload the barrels. If you place these barrels outside where they will be subject to the weather, be sure to drill holes in the sides and bottom to allow rain water to escape. Special hand-trucks for barrels cost approximately $100. A used one-ton propane fork-lift costs $4,000-$5,000.

BINS OR NESTING CONTAINERS are convenient and light weight tools to collect and handle most paper materials. They are usually constructed from plastic or canvas material and come in a variety of shapes and sizes. Such bins, which are used by commercial laundries and shipping firms, usually come with wheels and are ideal for rolling from one place to another, or on and off truck ramps. They are relatively inexpensive and are best suited for collection and storage of paper and aluminum. The cost for individual bins ranges from $15-$250.

LARGE CORRUGATED CARTONS or "gaylords" as they are sometimes called, can be used for the collection of light weight materials such as aluminum, plastics, and paper. They are available from moving and storage firms or shipping companies and can usually be obtained free or at little expense ($2-$10). However, corrugated cartons cannot handle much weight so their utility is limited. They don't wear well and one or two light rains will make them virtually useless—but recyclable.

SELF-DUMPING HOPPERS are employed by many recyclers for collection and storage of glass and metals, and can be used for transporting these materials to market. Unfortunately, a fork lift truck is required to raise hoppers high enough off the ground to be emptied, which limits their utility. Self-dumping hoppers come in many shapes and sizes and some are even equipped with rollers for easy moving. Hoppers are available from local steel fabricators and garbage hauling equipment manufacturers. Typical costs range from $250-$500 each.

REFUSE CONTAINERS AND DROP-BOXES are convenient for collecting bulky or big volume materials such as glass and newspaper. With potential to provide a complete and efficient collection, storage, and transportation system, these boxes come in sizes up to 48 cubic yards and may be rented from many refuse or construction companies.

These boxes do create a problem; a special truck is necessary to move them. Detachable receptacles are picked up by specially designed rail trucks for delivery to market where they can be unloaded easily. Both containers and trucks, however, can be expensive, so before purchasing or renting them, it is best that programs using them have high volumes and rapid materials turnover.

If covered, all containers, whether or not they are detachable, are excellent for collecting papers at un-

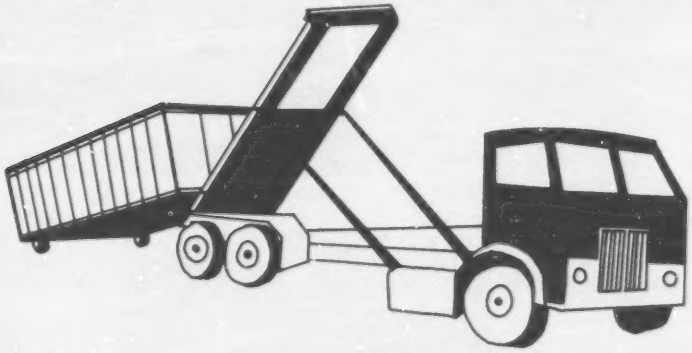
attended centers and depots because lids can be locked and customers can deposit their items in the small 18 to 24 inch slots near the top of the side panels, making theft practically impossible. That these containers may be divided into separate sections is another benefit; one receptable can then receive three colors of recyclable glass at once. Dropboxes cost from $2,000 to $4,000 each.

While recycling programs operate with almost all types of trucks (pickup, step van, dump, van, tractor-trailers, roll-off, or flat beds), some are obviously better suited for recycling than others and will greatly reduce your handling time and increase your efficiency. Two commonly used types are discussed here.

STANDARD VANS AND FLAT BEDS work best for transporting materials packed in 55 gallon barrels, bins, large boxes, or bales. They can be loaded with either a fork lift truck, hydraulic lift-gate, or loading ramps. Used vans and flat bed trucks are available for purchase, of course, but many recyclers have been able to arrange donations from local trucking or delivery firms.

DUMP TRUCKS are good for hauling materials such as papers which can be tossed in the back or loaded with a self-dumping hopper, and then easily

unloaded at the market. If you do not have a loading dock or some type of elevated ramp, loading a dump truck may present some problems as the top of the truck can be as high as 10 feet off the ground. If you use an open top dump truck you should have a canvas or mesh cover to keep materials from becoming wet or blowing out on the way to market.



ADDITIONAL EQUIPMENT

Additional equipment which you will need or find useful depending on the size of your program or volume include:

BALERS can be used to compact metals and paper for easier handling and volume reduction. They may be available for rent or on a loan basis from local paper brokers, so contact them before you consider purchasing such equipment. Downstroke balers cost between $3,000-$7,000.

GLASS CRUSHERS. See page 33. Over-the-barrel crushers are available for $300; hammerhill crushers can cost up to $6,000.

PAPER SHREDDERS will be useful if you are conducting a high grade recycling program. They may be required so that you can provide proof of destruction of papers coming from billing offices, state agencies, or others who deal in confidential information. Shredders vary in capacity and cost.

PAPER CUTTERS can be used to upgrade paper items such as telephone books, text books, and published documents by removing book bindings and bonding agents such as glues. Paper cutters are available from local manufacturers, and used cutters may be acquired from printers and book publishing companies. A typical cutter can be acquired for less than $1,000.

STRAPPING MACHINES can be used to bundle materials for easier handling and transporting. Though these machines do not reduce volume or create high density bales, they are useful for tying together large, bulky items such as corrugated papers, plastics and wood scraps, or for securing papers and other materials to pallets or other shipping containers. These machines are simple to use, inexpensive, and readily available in most areas. A usable machine can be acquired for $150.

CAN FLATTENERS AND MAGNETIC SEPARATORS are valuable if you are handling large volumes of metals. The magnetic separator will automatically segregate aluminum cans from steel cans allowing for greater efficiency in handling. Can flatteners are used to reduce the volume of your cans so that you need less storage space and they reduce transportation costs by permitting you to fit more cans into your containers or boxes. Again, these machines are available from local equipment manufacturers. Separators are available for $2,000; flatteners are usually twice as expensive.

FORK LIFT TRUCKS will be needed if you are using self-dumping hoppers or other bins and barrels which must be picked up during truck loading or unloading. Fork lifts are available in electric and propane models for use inside your warehouse or processing center and in gas and diesel models for use outside.

Fork lift truck manufacturers and dealers throughout the country can inform you of the various sizes and models which would be the best for your program. Costs are wide ranging according to size and options.

CONVEYORS may be useful if your operation requires moving materials from one part of your site to another; they can move recyclables from your collection point to a baler or glass crusher or simply move materials on and off trucks. There are several types of conveyers. Used ones can often be purchased from trucking firms and other warehouse operations for less than $100.

HAND-TRUCKS AND DOLLIES will be needed to move heavy barrels, bales and other bins and boxes from one place in your warehouse to another. They are available from equipment dealers, local manufacturers, or trucking and warehouse companies. Price ranges from $50-$150 can be expected.

LABOR

Your program must be planned according to the available pool of labor resources. A small center or depot with limited services and hours or a periodic weekend project can usually be handled by one or two people. However, a full-line center with extensive processing arrangements will require considerably more personnel, which is the reason that such centers are often established as community or organization projects.

Depending on the type of program you offer, labor will be needed for the following purposes:

- Education and community outreach programs.
- Record keeping, bookkeeping, and other administrative functions.
- Assisting the public in unloading recyclables from their cars, and properly sorting them into designated bins and containers.

- Various processing functions ranging from breaking glass or loading newspaper at a small center, to sorting, shredding, and baling at a large center.
- Truck driving, materials loading, and other routine warehouse work.
- General upkeep, maintenance, and care of the center, depot, or vehicles.

In addition to volume and diversity of your business, the transportation and marketing systems you choose will dictate processing and handling decisions, which in turn will determine the amount of labor you will need. Thus, if your broker has provided large drop-box containers for collecting materials, handling requirements will be minimal, which means you'll need labor mostly for processing and trucking. However, if you plan to use small bins and barrels for storage, you may have to regularly transfer several tons of newspaper or corrugated by hand which will require a large and energetic work force. In other words, recycling can work at practically any level of labor resources which may be available, but your progam must be planned accordingly.

If your program will be operated by volunteers, you should involve a broad base of community organizations to insure continuity and a sufficient supply of workers. Many programs have suffered setbacks or complete failure because of declining enthusiasm among a small pool of volunteer workers. This has been especially true of student-operated programs. Seek assistance from Scout Troops, service organizations, environmental groups, church members, school clubs, and anyone else who is willing to help.

There are incentives, however, which go a long way in alleviating this turn-over problem. First, because few people enjoy performing the same job day after day, you can offer job variety to workers; rotate them from task to task so they may learn as many as possi-

ble. You can also arrange for your volunteers to receive purchasing discounts with local businesses, movie houses, and sporting events.

Although you find staff on a volunteer basis, you may still desire or need paid managers or coordinators to provide supervision and ongoing direction and job training. Recycling programs may require a whole spectrum of normal business duties, such as bookkeeping, implementing license provisions, and negotiating with city officials, realtors, and insurance companies. These activities often demand more time and effort, possibly more skills than a volunteer can contribute.

If you are using paid staff, an attractive, competitive wage is necessary to retain interested and qualified personnel. While many recycling programs started with people who were willing to work for subsistence wages, this is becoming less and less common as recycling operations become more advanced and develop into an industry in its own right. If you are hiring people to operate glass crushers, balers, or other potentially dangerous machinery, you will find the need to pay appealing wages especially true.

In conclusion, the size and nature of your program will help determine labor needs. But remember that qualified and valuable help, volunteer or hired, does not come automatically. You must be willing and prepared to train and instruct your labor force in materials handling, public assistance, education, and safety procedures.

"Recycling - It's Up To You!"

IV. PUBLICITY & EDUCATION

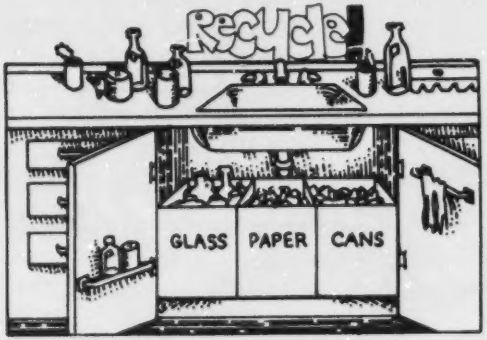
The importance of developing public interest in your recycling program cannot be overemphasized. As with any other new business, you must be prepared to spend considerable time and effort informing the public of who you are, what you do, and how you will be a beneficial addition to the community.

The manner in which you approach your publicity campaign is to a great extent dependent upon existent public recycling awareness. Your endeavors can range from a few posters and newspaper announcements concerning collection dates or center location, to comprehensive and lengthy explanatory meetings with city officials and other community leaders.

Your first step is to organize a publicity and education committee long before your scheduled start-up date. This committee's job is to develop long range strategy for promoting your program, determine media and publicity techniques, and decide who is going to make the required arrangements. You may need resource people to write press releases, contact reporters, develop public service announcements, speak at community meetings, plan school visits, and design posters. You must also determine what resources you have available and how to allocate them. For instance, if one committee member is a former newspaper reporter or has worked extensively with the media, that person would likely be best suited to become your press spokesperson and coordinate all press releases, news conferences, and promotions. A professional graphic artist or designer might agree to produce posters, billboards, and other visual tools. Whatever promotional approach you choose, remember that publicity planning takes time and energy.

A variety of publicity and education techniques and outlets are available in your community. Your program committee should determine how available resources can be adapted to your program, and directed to your community's needs and structure. For instance, if you

live in a small town or rural area, you may want to take a low-key, personal approach using door-to-door contacts, community newsletters, and meetings. If you are in a large metropolitan area you may fare better with more conventional mass media outlets such as television and radio public service announcements or newspaper coverage.



NEWSPAPERS

Newspapers will probably be the most accessible and inexpensive publicity channel available, so you should learn to work with reporters to help them better publicize your program. Recycling programs are "news" and your local newspapers will more often than not be willing to give you good coverage.

Before you begin your program, you should contact local reporters and editors to let them know what you intend to do and how soon your project will be underway. Editors assign articles and decide which stories will be featured, so visit them personally and explain the purpose of your program, what you will be collecting, and how this is going to help the community. There is no better relationship with the press than that based on personal contact.

In explaining how and why your program is newsworthy, you might point out that your program will divert specific amounts of garbage from the local landfill, and show how this is economically and environmen-

tally good for the community. You might also demonstrate that your program will create local employment opportunities or provide income for a local youth program or charity group.

You should also strive to become a continuing source of reliable news and information for reporters and media contacts. Someone from your press committee should be available to comment on solid waste management issues that are being considered by your city council or state government, and to tell reporters when there is an upcoming issue of interest. An informational position paper might explain how this issue will affect your community or your recycling program, and what your group thinks about it.

Most recyclers have found newspapers interested and willing to provide suppport, but you have to help by learning their needs, discussing the pros and cons of your program, and constantly working with them. Remember, newspapers will be your most direct link to the general public. Additionally, most newspapers have "Around the Town" or "What's Happening" sections or calendars that you should contact to list your recycling programs, activities and dates.

THE PRESS RELEASE

The successful use of press releases is a key component to a favorable and advantageous relationship with all media. The purpose of press releases is to attract media attention to your group or an upcoming event. Press releases can carry several messages including: 1) an invitation to attend and report a scheduled news conference or event; 2) a longer statement containing data and information which you want to publicize (i.e., a report on the degree of public participation in your program or a report on the tonnage which you have recycled during the first six months of operation); or 3) a position paper stating your views on a specific issue and explaining how it may be affecting recycling efforts in your community.

A press release should answer basic questions of "who, what, when, where, and why" which might logically be asked about any program or event. You should include this basic information in the first sentence or two so the reporter or news department can quickly learn what the press release is about and decide if it deserves coverage. You should be careful never to editorialize in a press release. Leave that to the copy editor.

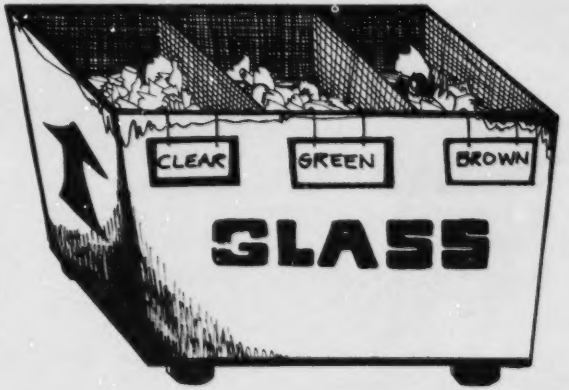
You should list a contact person on your press release whom the press can reach for additional information. However, be sure that this person does indeed have additional information to offer and will not simply reiterate what the press release has already stated. Finally, if your program is new, or if you have had only infrequent contact with the local press, you should attach a "Background Paper" explaining how your program began, what your environmental goals are, and what some of your past accomplishments have been.

THE NEWS CONFERENCE

If you have a major news story or breakthrough in your program (e.g., receiving a grant or establishing a cooperative working relationship with the city solid waste utility or local garbage haulers), you may want to hold a press conference so the press and media can ask specific questions concerning these developments or film recycling in progress.

Reporters are invited to many news events each week; those which turn out to be insignificant only irritate the press. When you schedule and announce a press conference be certain that you actually have an important "news" event to report. If possible, it is a good idea to have a person with a media "name" (the mayor, local solid waste officials, a well known environmentalist, etc.) to add to the attraction.

When planning a press conference or media event you should take advantage of the old adage that a picture is worth a thousand words. Set up your conference at your recycling center using a truck or drop-off station as the backdrop. Or take the reporters on your collection route or to one of your processing centers so that action pictures can accompany their articles. Be sure to tell the photo editors what you plan so that they assign a photographer to the event.



MEDIA MAILING LISTS

Often the key to consistent press and media coverage will be a good mailing list. You should develop an extensive list of press and media contacts in your area including: daily, weekly, and monthly newspapers, special interest press such as the Labor Press or Cattlemen's Association Newsletter, college and high school papers, magazines, and even free-lance writers who may have an interest in your program. This list will allow you quickly and efficiently to inform the press of a news conference or late breaking story which may be of interest.

You should learn which local media and newspaper reporters are best contacted with a press release or news idea. Remember, you cannot be an effective publicity person if you do not know how the media works; read your newspapers, listen to the radio, and watch TV with an eye and ear to the kinds of stories your local media are likely to cover, then try to arrange your "news" events accordingly.

TIMING A PRESS RELEASE OR CONFERENCE

Learn local media deadlines and schedule your press releases and news conferences to accomodate them. A good rule is that a press release should reach the reporter or news department three or four days before an event to allow the reporter or assigning editor plenty of time to plan coverage. It will help you to include deadline information on your media mailing list.

It is also helpful to follow up your press release with a phone call to a friendly editor or reporter that highlights its contents.

NEWSPAPERS & MAGAZINES

These publications can be valuable outlets for publicity and news coverage for your program as they are often eager to find local news stories and they usually have the time to do more extensive reporting than the daily papers or electronic media.

Many such papers and magazines are operated by part-time or volunteer staff who rely heavily on articles written by others. Try to discuss your program plans personally with the editors so that you can avoid submitting articles which do not have a chance of being published.

RADIO PUBLICITY

Radio coverage, especially in the form of public service announcements or talk and discussion shows, can be a valuable and inexpensive source of publicity. Federal broadcasting regulations require all radio and television stations to "discover and fulfill the tastes, needs, and desires of the community and service area for broadcast service." Because of these requirements, radio stations have talk shows, education programs, and community events calendars designed to allow public access to the airways for discussions on community issues and to inform the community of events of local interest.

You should contact your local radio stations to learn about their public issue programs and how your group can obtain air time. Once you know of a program on which you might appear, you should talk with the program director or station manager explaining why your group is newsworthy from a community issues perspective and what you have to offer.

Additionally, all broadcast stations must provide air time for public service announcements, so ask the station manager about requirements and format for public service announcements (PSA's). Radio commercials or PSA's are not difficult to produce, and many stations will help make them.

Finally, if you have the money, radio advertising is an excellent way of reaching large numbers of people in your community at a relatively inexpensive cost. Some radio stations, especially in small towns or rural areas, sell air time for as little as $15 or $20 per minute and this can turn out to be an economical way of reaching the potential recycling public.

SAMPLE PUBLIC SERVICE ANNOUNCEMENTS

15 Second Announcement For Immediate Release

MOST WASTE PAPER ISN'T WASTE. THE BAY CITY RECYCLING PROJECT CAN RECYCLE ALL TYPES OF PAPER. CALL 222-7777. THAT'S BAY CITY RECYCLING 222-7777.

20 Second Announcement For Immediate Release

AMERICA HAS ONLY ONE DOMESTIC SOURCE OF TIN. THE TIN CAN. PLEASE, DON'T THROW IT AWAY. CALL THE BAY CITY RECYCLING PROGRAM AT 222-7777 FOR THE LOCATION OF THE RECYCLING CENTER NEAREST YOUR HOME. THAT'S BAY CITY RECYCLING 222-7777.

TELEVISION

The laws and regulations for radio public service time and programs also apply to commercial television stations. However, since television is a visual medium, program and PSA requirements are more involved and expensive than for radio, and therefore more difficult for local groups to use.*

Again, contact the public service director or station manager about PSA requirements and discussion programs. Many stations will work with public interest groups to design quick and inexpensive PSAs. These may be nothing more elaborate than a slide of your program logo or symbol with a brief audio message in the background. Though these announcements are not visually exciting, they can be very effective..

Finally, if solid waste management or recycling is a controversial issue in your community, you should watch and listen to radio and television editorials which may oppose your program and be prepared to approach the station to contribute an editorial rebuttal.

*PSA: Public Service Announcement.

SPEAKERS BUREAU

Another outreach and education tool is the speakers bureau—volunteers organized to go to schools, church groups, service organizations, colleges, and other interested groups to talk about your recycling program and explain how it contributes to the community. Almost all civic groups have regular evening or luncheon programs to which they invite community leaders or special interest groups to address their members.

A slide presentation will help demonstrate solid waste problems in your area and what your recycling group is doing to solve them. If you don't have the resources for a slide presentation, you should at least develop a "hands on" display showing the materials which your program recycles and how to properly prepare these materials for recycling. A verbal presentation is always enhanced by visual aids, even if no more elaborate than a flattened steel can or a stack of bundled newspaper.

SCHOOL PROGRAMS

Young people are very interested in environmental matters and are curious as to how recycling contributes to environmental improvement. You should prepare a classroom presentation showing the waste habits of the community, how this contributes to the depletion of natural resources, why the improper use of landfills or dumps is environmentally unsound, and how recycling can help correct some of these problems. Again, try to develop visual aids to go along with your presentation as they will hold the attention of younger students and will contribute to their understanding of the problem. You should inform the teachers in your area that a school curriculum guide for recycling is available for grades K through 12 and can be obtained from the U.S. EPA Office of Solid Waste.

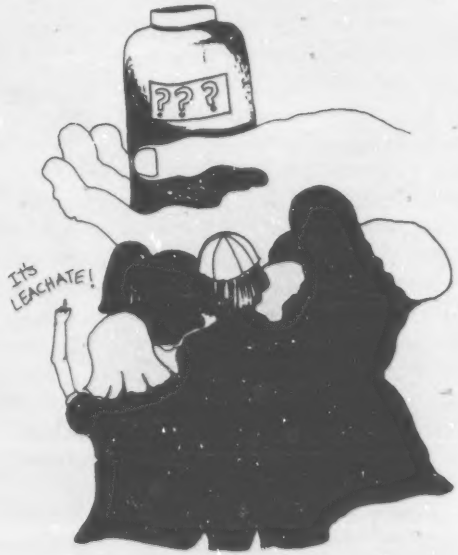
A field trip to your local garbage dump or landfill followed by a tour of your recycling center can be an excellent learning experience for any age group.

Another way to involve school children in your program is to sponsor essay, poster, logo or slogan contests. These can be valuable to publicize your program, gain widespread community support, and develop graphic designs or posters at very little expense. You might ask merchants and businesses in your area to donate prizes for such contests; movie or concert tickets or trips to recreational areas make excellent rewards. You might also seek donations of money or art supplies for poster and graphic contests.

Students can also be very helpful in door-to-door publicity campaigns. At the least, they can take reminders home to their own parents.

Many schools and teachers offer extra credit for community service involvement, so you should contact your local school board and PTA to discuss how you can involve their students in community recycling efforts.

PUBLIC DISPLAYS



A large visual display for meetings, rallies, festivals, celebrations or other large public gatherings, is an excellent means to reach large numbers of people with information about your program and its relationship to solid waste management problems and issues in your community.

A display of this type might include instructions on preparing materials for recycling, photos of your centers or depots, data on the amount of waste generated in your area, or demonstrations of how materials are recycled into new products. The display might even be an automated audio-visual presentation utilizing slides and a taped recorded message. Any display should be as mobile and versatile as possible; certainly, it should not be so cumbersome as to discourage its use.

Libraries, universities, state office buildings, bank lobbies, and shopping centers are excellent locations for displays. You should request these establishments to exhibit your display for a few days at a time.

NEWSLETTERS

Community newsletters, church bulletins, employee newspapers, and other publications aimed at small and select audiences can be useful for announcing new programs or providing handy reminders of ongoing activities. Learn what publications of this type exist in your community, and ask that they include information about your program.

Once your program has established itself you may want to publish your own newsletter to send to your volunteers and supporters. This can be a valuable way to inform the public of the success of your program and to demonstrate the impact you are having on the community. This is also an excellent way to keep enthusiasm alive and to generate continuing support.

OTHER TIPS

An easily reproducible **logo** should be designed and used as a permanent program symbol which the public can recognize. This logo should appear on all of your publicity announcements, publications, signs, collection bins, barrels, and trucks.

Brochures explaining all aspects of the program, especially if you have a pick-up service, can be printed up relatively inexpensively.

Wall Posters can be used to "blitz" your neighborhood or community to announce the opening of your program. They are also a highly visual and inexpensive way to remind the community of what materials you accept and where your depots or centers are located. They should be visually attractive with as little written copy as possible. The who, what, when, where, and why format along with the program logo or symbol works quite well for posters and handbills.

Try to display your posters in places where they will stay posted the longest (store windows, taverns, res-

taurants, etc.) and not on buildings, fences, or other places where they are not welcome. You should become familiar with the merchants and store owners who display your posters; they could become a valuable source of commercial accounts or other resources for your program.

Calendars announcing where your centers are, when you are open, and how to properly prepare materials are helpful and inexpensive reminders for the household. If necessary, one sheet of paper will suffice for a calendar which will alert the household recycler to your recycling days for an entire year.

Contact the **"Welcome Wagon"** or **"Community Hostess"** organizations or your local real estate agencies to see if they will include information about recycling programs and opportunities in your area in the information packets which they provide for new residents and homeowners.

List your recycling centers in the **Yellow Pages** under "Recycling."

Public Utilities are often willing to include notices from public service groups in their billings. Contact the offices of the utilities or city bureau in your community to learn about mailing policies.

If you live in an area with a large population of **Minority Groups,** you should publish your posters and other information in their respective languages.

City and State Public Information Offices can be very helpful in distributing information about public

LAST WORDS ON PUBLICITY

service programs or otherwise bringing you together with the public.

In conclusion, you should use any and all of the publicity tools to which you can gain access. Some may work very well, others not at all. You will never know until you try them out. Publicity and public relations frighten many people, but they should not. Most who work in the newspaper, media and publicity fields are eager to help community programs and are willing to share their knowledge with the novice. Ultimately, good publicity and education programs are nothing more than dedication and good hard work.

Again, publicity and education constitute a never ending task which must be done throughout your program and not just at the outset. Many recycling programs have enjoyed early success and high participation rates during the first few months, only to see operations fail in the end because community outreach and education programs petered out.

The following publications may be useful to your publicity committee in designing and planning your publicity and education programs:

1. **The Community Awareness Program in Somerville and Marblehead, Massachusetts,** Environmental Protection Agency publication (SW-551).
2. **Projecting Your Image, How to Produce a Slide Show,** League of Women Voters publication number 296.
3. **Breaking into Broadcasting,** League of Women Voters publication number 586.
4. **Media Information Packet,** Environmental Action Foundation publication MD-1.
5. **Communication Workbook,** a packet of the Northern Rockies Action Group, Volume 1, Number 4, 1976.
6. **The Whys and Hows of Public Service Announcements** reprinted from **Access** magazine, available through the National Citizens Committee for Broadcasting.
7. **Residential Paper Recovery,** A Community Action Program, Environmental Protection Agency publication (SW-553).

V. FUNDING & BUSINESS

TYPES OF ORGANIZATION

A remaining hurdle any recycling group must face is that of financing and operating a business concern. Like any other enterprise, a recycling business can operate under several organizational structures. While this booklet can by no means offer a complete lesson on business administration or review all possible ways to finance your program, it does offer basic ideas and information on single proprietorships, partnerships, corporations, non-profit organization, legal requirements, loans, and grants. For more specific information about the advantages and liabilities of various business models, contact your state office of corporate affairs. It is also highly advisable that these ideas not be relied upon in specific situations without checking further with a lawyer, an accountant, the appropriate government agency, or other knowledgeable source.

SINGLE PROPRIETORSHIP The simplest form of business organization is the single proprietorship. This is a one-owner business with minimal legal formalities. The owner is personally liable for the debts and obligations of the business and he/she must comply with local and state licensing requirements.

PARTNERSHIP A partnership is an association of two or more persons who do business as co-owners for financial profit. The partners are personally liable for the debts of the business so that, if the partnership is unable to fulfill its financial obligations, the partners become responsible. There are usually no requirements that partners obtain permission from the state to form a partnership, but they must comply with any state and local registration and license requirements.

CORPORATION A corporation is a legal entity which limits the liability of the stockholders for the debts of the corporation. Under most state statutes of incorporation the corporate organization itself is liable for debts which might result from the operation of the company. State requirements and obligations for corporate entities vary from state to state so check with your attorney and the state department of corporate affairs before entering into a corporate agreement.

NON-PROFIT CORPORATION A federal, non-profit, **charitable** corporation [26 United States Code, Section 501-(c)-(3)] is exempt from paying certain federal income taxes and allows an organization to receive monetary contributions and other donations that are tax deductible for donors making contributions. Contact your local Internal Revenue Service office for specific information on deductible and non-deductible corporations. Additionally, a non-profit, tax-exempt corporation is eligible for the cheapest bulk mailing rates. Most other requirements and obligations which apply to a standard business corporation also apply to a non-profit, tax-exempt corporation.

Though there are numerous Internal Revenue Service requirements which must be satisfied before exempt status is granted, the key requirement is that your organization be involved in charitable, educational, or scientific work. Many recyclers and environmental groups have demonstrated their eligibility for non-profit status through their work in such areas as solid waste and environmental education. Contact your local IRS office to obtain detailed requirements and application forms. IRS publication 557 ("How to Apply for Recognition of Exemption of an Organization") is an informative booklet and should be read thoroughly before pursuing exempt status. Your local

IRS office should be able to provide assistance in interpreting and filling out appropriate forms.

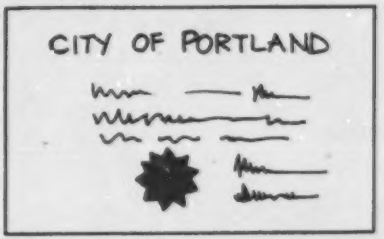
Before you apply for non-profit status you should be aware that there are certain restrictions on companies working under this status which may prove disadvantageous. In general, if a substantial part of the activities of your organization consists of lobbying or otherwise attempting to influence legislation or elections, your organization's exempt status will most likely be denied. The key question is: what is substantial?

Be careful in the area of restrictions on lobbying. For purposes of tax exempt status you may not, as a substantial part of your activities, either attempt to influence legislation through a move to affect the opinions of the general public or attempt to influence legislation through communication with a member or employee of a legislative body, or any government employee involved in the formulation of legislation.

You may, however, provide technical assistance if requested, make available results of non-partisan research, study or analysis, and communicate on matters affecting the existence or powers of your organization.

An organization, under certain conditions, may elect to replace the traditional "substantial activities test" with a specific limit defined in terms of expenditures for influencing legislation. A special form (#5768) must be filed with the IRS to make this election.

There are exceptions to these restrictive provisions and we suggest that you contact your local IRS office for complete details.



BUSINESS AND LEGAL REQUIREMENTS

Once you have decided on the basic legal structure for your program, you will be faced with numerous business and related requirements. Though the business standards vary from state to state, there are many common threads:

- It is usually the responsibility of the employer to collect, and deposit with the appropriate government agency, Federal and state withholding taxes, city wage and employment taxes, transportation and service district taxes, and other business and income taxes. Contact your local IRS and state department of revenue for the tax requirements and rates which will apply to your business.
- Most states require that employers provide accident insurance or contribute to a worker compensation insurance program. Contact your state workers insurance or employment office to learn what the employer requirements and obligations are in your area.
- Most cities and state governments require that you obtain a permit or license to operate a business. Contact your city and state governments to learn of their specific license requirements and costs.
- Under zoning and related ordinances, most towns and cities restrict certain types of structures and business activity to defined areas (light industrial, multi-unit residential, commercial, etc.). Contact your local zoning

and planning offices to learn what zoning restrictions exist in your area. (NOTE: many recyclers have experienced difficulties with city zoning boards classifying them as scrap and junk dealers which has restricted their location to industrial areas rather than to light commercial or residential neighborhoods. You may have to work with your local zoning and planning offices to demonstrate that a recycling or reclamation center is **not** a junk business or scrap yard.)

- Most states have public utility carriers or transportation commissions which regulate and control the movement of goods within their state and require that public carriers obtain permits to use the public highways. Additionally, the Interstate Commerce Commission (ICC) regulates materials moving across state lines. Contact your state transportation office and your local office of the ICC to learn what regulations apply to recyclable materials.

If all this seems confusing and complicated, remember that many businesses are able to live by the rules. Furthermore, technical and financial assistance programs and workshops are available to help the beginning businesspeople understand legal requirements and to help them improve management practices and organizational skills. Among these programs are:

- Tax advice classes and workshops offered by local offices of the Internal Revenue Service and by most state revenue departments.

- Pre-business workshops offered by the U.S. Small Business Administration to provide advice to persons who are considering starting new businesses. These programs are free of charge and offer the advice of lawyers, CPAs, corporate executives, and management specialists to help you comply with the particular business laws in your area.
- The Small Business Institute program offers advice and direct assistance from local business school students to help analyze and offer solutions for small business problems. Contact colleges and universities in your area to learn if they participate in this program.

- Most state and local departments of economic development and planning offer assistance and workshops on business management and operations. Contact your local offices of these agencies to learn more about the specific programs they offer.

The Small Business Administration has a number of publications available on financial planning and management for small business. Among these are:

1. **Checklist for Going Into Business.** No. 71. Free.
2. **Keeping Records in Small Business.** No. 155. Free.
3. **The ABCs of Borrowing.** No. 170. Free.

There are Small Business Administration offices in each state where these publications may be obtained (listed in the phone book under United States Small

Business Administration) or you may order them from the U.S. S.B.A., P.O. Box 15434, Fort Worth, Texas, 76119.

Other Small Business Administration publications are available for purchase from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. A sample includes:

1. **Financial Record Keeping for Small Stores.** No. 045-000-00142-3. $1.55
2. **Insurance and Risk Mangement for Small Business.** No. 045-000-00037-1. $1.90.
3. **Personnel Management Guides for Small Business.** No. 045-000-00126-1. $1.10
4. **Improving Material Handling in Small Business.** No. 045-000-00041-9. $0.75.
5. **Handbook of Small Business Finance.** No. 045-000-00139-3. $1.50.

Other than privately negotiated loans from community supporters or members of your organization, most small businesses such as those in recycling have two avenues available for borrowing money: traditional full service banking institutions and the U.S. Small Business Administration.

When you consider approaching a banking institution to borrow money for your recycling program you will need to provide information on the financial resources of your organization. Though necessary information will vary from case to case and bank to bank, in general you'll need the following:

1. A current financial statement (balance sheet) showing all of your assets and liabilities;
2. an earnings statement (listing profits and losses) for the previous year and for the current period to date of the balance sheet;

3. current financial statements for the owner, or each partner or stockholder owning 20 percent or more of the corporate stock;
4. a list of the collateral to be offered as security for the loan with the estimate of the value of each item; and,
5. the amount of the loan requested and an explanation of the exact purposes for which the loan will be used.

If your program or business is just starting out the bank will ask you to provide as much of the above information as possible. It will also ask for:

1. A description of the type of business to be established and a description, with detailed resumes, of your experience and management capabilities;
2. an estimate of how much you and your partners or stockholders have to invest and how much you will need to borrow; and,
3. a detailed projection of earnings for the first year the business will operate.

Interest rates will vary from bank to bank and area to area.

It can often be helpful to your program to establish a line of credit and a successful banking record (demonstrating that you can borrow money and pay it back within the given time limits) before you really need money for your financial survival. A good way to do this is to purchase a piece of machinery or other equipment on credit from a bank, even if you can afford to pay for it outright, so that you can establish a successful credit record.

GRANTS

The Small Business Administration has numerous loan programs available to the public; your local SBA office can advise about loans potentially available to you, and the interest rates and lending restrictions for each. The SBA does not loan money to non-profit businesses or organizations. Most SBA programs lend money at the same rate of interest as regular banking institutions, but loans are sometimes easier to obtain because of different and more relaxed lending criteria.

By Federal law, the Small Business Administration may not lend money to a business if that business can obtain funds from a bank or another private source. Therefore, you must first seek private financing before applying to the SBA. Because of this, it is a good idea to meet and establish a good working relationship with your local bank officers. Contact the U.S. Small Business Administration, Washington, D.C. 20416, or the local office in your area.

Grants are direct gifts of money, usually from private foundations or governmental agencies. Grants have been the source used to establish a number of recycling and environmental programs. Grants are usually given to non-profit or educational organizations for specific projects such as developing in-school environmental education programs, purchasing equipment to operate innovative programs, or for doing research studies on a particular problem within the field. Most grant donating organizations do not provide money for day-to-day operating expenses or provide salaries for the project staff, and they usually restrict their grant monies to organizations and programs rather than to individuals.

When considering the possibility of submitting a proposal to a foundation, you must study your needs carefully, gauge the demand your proposal will be meeting, and determine if your proposed program will encompass and benefit an audience wider than the

regular reaches of your program. Though the foundation you choose to submit a proposal to will have individual requirements and will be looking for you to meet specific criteria, in general the foundation will be looking at your submitted proposal for the following questions:

1. Is the project unique or has there already been a project or study done which is similar to yours?
2. Will the results of the project or research produce data or performance standards which can measure the success or failure of the program?
3. Is the time right for a project such as the one you are proposing? (For instance, though the project you are proposing may be technically feasible, the general level of technology or market conditions to make this program socially useful may not yet exist.)
4. Does your organization have the resources and skills to operate the program which you are proposing? Can this experience and expertise be adequately documented?

In addition to the broad questions listed above, a foundation will expect you to provide specific and detailed explanations of how the program will operate, what needs will be served, and how much money you will need to complete it successfully. Therefore, you should be prepared to provide the following information as well:

1. A brief summary of what is to be accomplished with the grant and an explanation of how it will improve your program and how

you will fund your activities after the funding period has expired.

2. A detailed, realistic, and justifiable budget indicating what the money will be spent on and who will be responsible for administrating and disbursing the money.

3. A demonstration of how such a program is compatible with the goals and orientation of the foundation.

Oftentimes, large foundations such as the Rockefeller, Ford, or Carnegie Foundations are only interested in funding national or international projects with far-reaching social impact such as cancer research, educational television or world hunger. While it is not impossible to receive funding from these large national foundations, experience has shown that community based, small scale technology and research projects have a much better rate of success with locally based foundations that are more in tune with needs of the immediate community. Thus they are more likely to invest money at a local level.

The federal government also has several grant programs which might be available to your program. These grants are listed in the **Catalog of Federal Domestic Assistance** which is published annually and is available at most public libraries. Some Federal agencies you may want to contact for specific grant programs are:

- U.S. Environmental Protection Agency
  Office of Solid Waste
  Washington, D.C. 20460

- U.S. Department of Health, Education, and Welfare
  Office of Education
  400 Maryland Ave. S.W.
  Washington, D.C. 20202

- U.S. Department of Labor
  This agency offers several job training and employment grants under the Comprehensive Employment and Training Act (CETA) administered through local city and county labor or employment offices. Among these are:

  Title I: Comprehensive Manpower Services. Primarily used for job training programs.

Title II: Public Service Employment. This is a transitional program to move people into unsubsidized employment.

Title III: Special Federal Programs. This is a program to provide summer work experience for economically disadvantaged youths.

Title IV: Offers three programs: emergency jobs, public service employment with no transition required, and special public service employment projects.

STATE AND LOCAL GRANT PROGRAMS There may be several grant programs available through city and state offices of solid waste management and environmental quality. For information on specific grant opportunities in your area, contact your state offices of these agencies.

FUNDRAISERS

Many recyclers have successfully used fund-raising events as a way to earn money for their programs. These benefits can not only generate money for your program, but can also provide opportunities to increase public awareness and understanding of your objectives.

Such money making benefits can range from small, low-key activities such as bake sales and rummage sales, which can be quickly and easily organized, to major activities such as community-wide auctions, dances, or concerts. Usually, the larger your financial goal, the greater the level of organizational and promotional skills and commitments required. Don't expect to raise a thousand dollars from a bake sale held on a Saturday in someone's back yard.

On the other hand, don't attempt to put on a large concert featuring name entertainment unless you have the people on your staff with the proven skills to run such a program.

There are professional promoters in many cities who will make themselves available for organizing large concerts or other fundraising activities for a fee or for a percentage of the gate. These promoters can be found in the Yellow Pages under "Concert Promotions."

In conclusion, do not overuse the benefit approach to raise money. In particular, do not use it to mask poor management. It is a bad habit to operate a losing program month after month with the hope of bailing it out with a major fundraiser. Use benefits for special activities when you need or want a special push for your program, or perhaps when you have exhausted all other means for generating funds.

VI. PROOF: PRT HISTORY

As we have stressed throughout this booklet, making such an endeavor as a recycling center successful requires time, money, dedication, and tenacity when the going gets rough. We hope that the following history of the Portland Recycling Team will provide you with encouragement and allow you to see how the ideas and suggestions made in the preceding chapters have been utilized by a specific recycling organization.

From its beginning as a single item drop-off program, recycling approximately ten tons per month, the Portland Recycling Team (PRT) has grown into a model recycling operation which now recycles a full line of materials from papers to plastics, and diverts over eight hundred tons of garbage from Portland area landfills every month to available markets.

Today the Portland Recycling Team has seven permanent drop-off centers, a centralized warehouse for storage and processing, several high-grade paper programs, and numerous commercial accounts with Portland area businesses. PRT employs almost sixty full-time and part-time people in various job capacities and is widely considered to be a valuable social, environmental, and employment resource for Portland and its citizens.

The United States Environmental Protection Agency has decided to look at the history, funding, orientation, and overall operations of Portland Recycling Team as a "potential" model for other recyclers and potential recyclers.

Like many environmental activist groups of the 1970's, the Portland Recycling Team originated on a college campus, Portland State University. Taking note of large volumes of garbage on campus, and associated large garbage bills, a nonprofit student housing corporation (Portland Student Services) decided to investigate the possibility of disposing of student garbage itself. Finding this infeasible, efforts were next

aimed at trying to reduce some of the volume of garbage in the student housing complex through the practice of recycling.

The first effort at recycling was a glass drop-off station in the basement of one of the student housing buildings. The goal was to simply reduce the volume of waste, as it was not known if there were stable markets for glass once it was collected. Fortunately, it turned out that the Owens-Illinois Glass company was concurrently developing a program for buying glass from the public to use in cullet operations.

At the start, the Portland Recycling Team operated with a borrowed truck, volunteer labor, a minimum of equipment, and a maximum of energy and enthusiasm. The glass was hand-crushed in 55-gallon barrels which were loaded on a borrowed pickup truck using only muscle power, not an easy chore as one 55-gallon barrel of crushed glass can weigh as much as 500 pounds. For awhile, the Oregon National Guard helped

on Saturdays by loading the glass in its trucks and delivering it to market, in exchange for lunch.

PRT soon realized that a commitment to a full-line recycling policy was essential, if it was to have any impact on official solid waste practices and policy in Portland. So, PRT decided to accept all items that were recyclable, regardless of their potential market price.

At this time, other Portland groups were also sponsoring recycling programs such as paper drives run by scout troops and waste paper companies. But the Portland Recycling Team was the only organization accepting **all** items. For this reason, PRT was soon perceived by the public as an environmental group involved in recycling activities because of a concern for the environment and a desire to promote the principles of reuse, reduction, and recycling.

As word about PRT and its purpose spread, the community at-large began to use its services, soon forcing it to move off-campus. This in turn made the center known to more and more people; the volume of collected recyclable materials began increasing regularly and was soon up to 70 tons per month. The resulting income from sales allowed PRT to expand its operations and to purchase a used truck with a lift gate to facilitate delivering materials to market. Having its own truck enabled PRT to establish a more standardized base of operations. It also allowed PRT to develop a program of satellite projects which are operated by community organizations (usually schools, churches, neighborhood groups, or scout troops) and to offer once-a-month recycling services to neighborhoods throughout the Portland area. PRT does all of the handling, trucking, and marketing, as well as some of the education and publicity work for these projects in exchange for 50 percent of the income from materials sale. The community sponsor receives the other 50 percent for providing the workers and for manag-

ing the on-site program. This enables PRT to offer recycling depots in neighborhoods which otherwise could not support them, and it allows the community groups to recycle and generate income with a minimum of expense and commitment. Today PRT has 28 projects of this type.

Public acceptance of recycling activities and a general environmental concern supported growth of the PRT program through 1973. Surplus income made it possible to open a second major center in early 1974. Located in a university neighborhood, the original center served some of the best educated and wealthiest people in Portland. Therefore, when the opportunity for expansion presented itself, a deliberate decision was made to establish the second center in a mixed, working class neighborhood so that a more diversified group of people would become exposed to recycling and so that PRT could establish a broader base of support in the community.

This was considered a very daring move; the so-called "experts" claimed that only the educated and well-to-do would recycle because they were more aware of social issues and had the spare time to take materials to a center. However, through a program of community outreach, education, and tight financial management, the new center was accepted and supported by the public.

By 1974, PRT was recycling over 160 tons per month and was beginning to feel established. Then, the recycling industry experienced the greatest price boom and subsequent collapse in its history.

What happened was that a relatively healthy worldwide economy, especially in the Far East, coupled with increased housing starts in the United States, created an all time high demand for paper fibres. At the same time the supply for paper fibres was at an all time low and paper brokers, especially export brokers, were willing to pay whatever the market demanded.

The price for newsprint went over $70 per ton, computer cards were up to $200 per ton, and all other types of paper were bringing the highest price ever.

However, boom quickly turned to bust as the American economy began to decline. Housing and construction starts decreased. So did the demand for paper fibres. Japan and other Asian countries dropped out of the market almost as quickly as they had entered—drying up the export market. (The EPA chart on page 76 outlines price fluctuations as they occurred during this period.)

By December, 1974, newspaper prices had dropped from $70 per ton to $3. Often the brokers weren't even accepting paper, and sometimes PRT couldn't give it away. This problem was compounded by the normal December recycling drop-off due to inclement weather and the holiday season. PRT's income collapsed, and its financial reserves were rapidly exhausted.

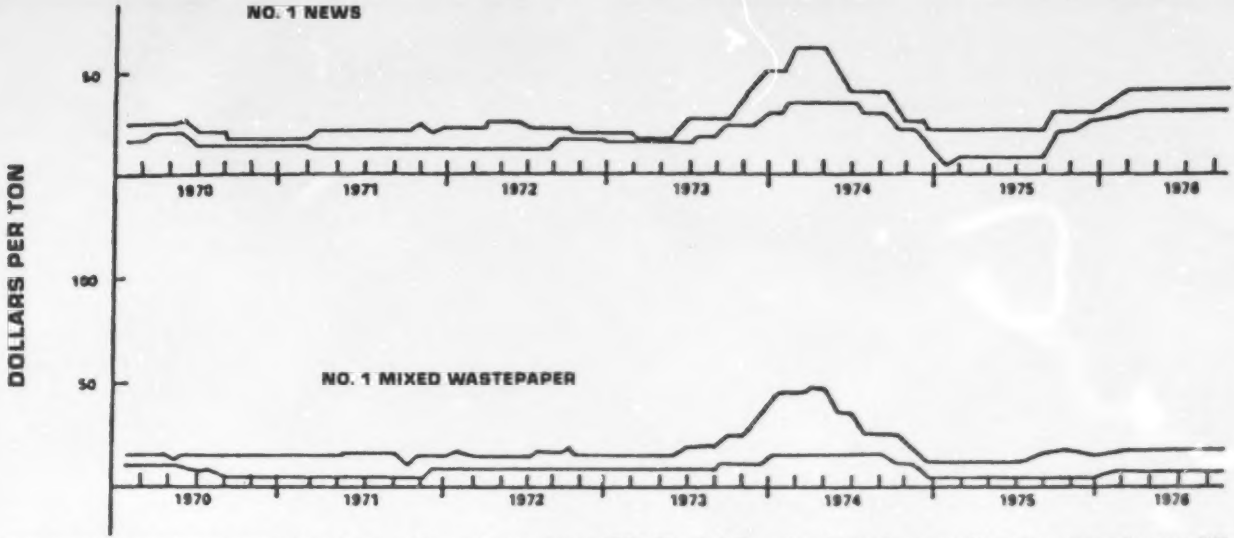
Consequently, the Board of Directors and the staff voted to shut down operations and to stop recycling altogether rather than to change their principles and become something other than a full-line program. Signs announcing the closure of PRT were hung on the doors on December 24, 1974, and everyone on the staff accepted the fact that PRT had come to its end.

However, during its final days, PRT had produced a position paper to explain the financial situation and inform the public why PRT was about to cease operations. This paper came to the attention of an Oregon State Senator and a member of the Portland City Council who went to bat for PRT, calling on many civic and industry leaders to solicit donations to keep the centers open. Ironically, after months of financial struggle and within two hours of hanging the "closed" signs, PRT received a call from a large paper company in the Northwest announcing a donation of $2,000. This money allowed PRT to reopen and to get through the next month of operations. By March, 1975, PRT had received over $8,000 in donations from the business community, prices were on the increase, and PRT was able once again to offer full recycling services to the community.

So, PRT stayed in business through 1974 and 1975, while many other recycling operations in Oregon and throughout the country failed. This may be attributed to the willingness of the staff to work despite the lack of wages, the diversity of materials which allowed PRT to make money from recycling glass and other materials when paper prices were low, and a nonprofit tax status which brought donations from individuals and corporations.

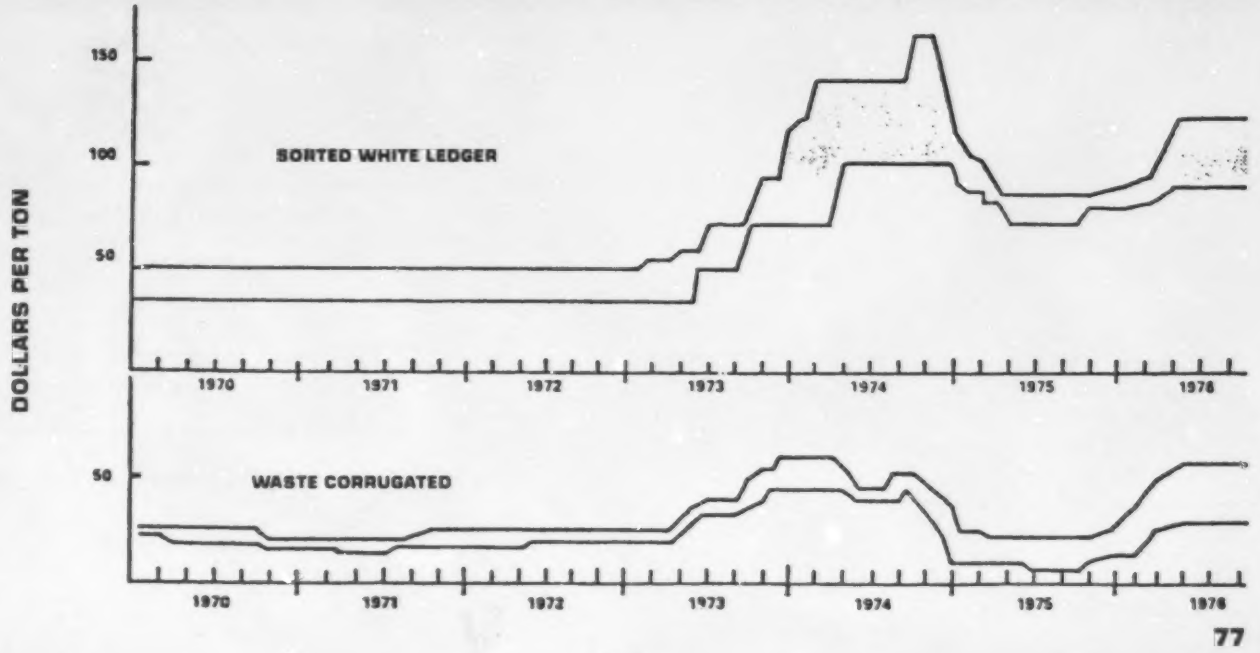
The years of financial crisis brought realization that PRT had support in the community and that it was doing something which the public wanted. This realization gave PRT the confidence and incentive to develop the political and community ties necessary to make

1970-1976 MARKET PRICE FLUCTUATIONS FOR WASTEPAPER



Market prices for wastepaper were subject to extreme fluctuations during the 1973-76 period. Plotted on the graphs are weekly price quotes appearing in **Official Board Markets** for four important wastepaper grades since 1970. The price range presented for each grade reflects the spread of the high weekly quoted prices among four representative market areas: New York, Chicago, Los Angeles, and the South (sic). (Prepared by SCS Engineers and EPA staff.)

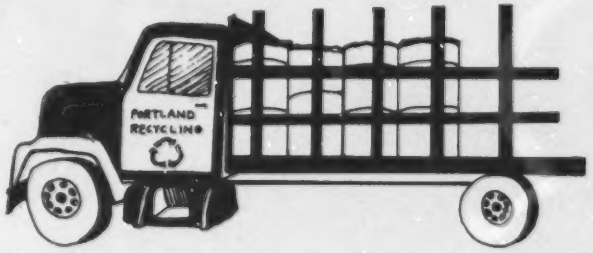
1970-1976 MARKET PRICE FLUCTUATIONS FOR WASTEPAPER



recycling a viable and continuing part of the City's solid waste scheme. So, from a position of relative isolation and obscurity, PRT emerged from the 1974-75 financial crisis as a recognized community asset and a valuable participant in the formation of the city, state, and regional solid waste plans as the leading proponent of source separation recycling.

The year 1975 marked a very important period in PRT growth and development. A large warehouse and processing center was obtained in Northwest Portland to serve both as a community drop-off center and a storage, processing, and transfer facility. Additional permanent drop-off recycling centers were established, which brought the total to five. Several more trucks were added to an ever growing fleet, either through outright purchase by PRT or by donation from area businesses and trucking firms. Several more weekend projects were developed, and the education and community outreach program began providing speakers on a regular basis to area schools, club meetings, and community affair presentations.

Also at this time, commercial accounts in high-grade paper, glass, and corrugated became part of PRT's operation. Previously PRT had only one commercial account: collection of paper from the University. Now it began actively soliciting commercial accounts from print shops, law firms, office buildings,



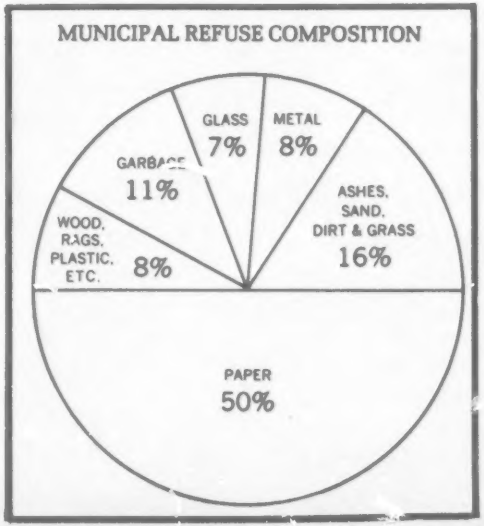
and other businesses. Collection routes were developed, competitive price contracts offered, and sorting and processing by paper grades conducted at the main warehouse. This allowed PRT to build its position in the local waste paper economy, become less dependent on income from citizen drop-offs, and accumulate financial reserves for investment in other areas of company interest.

From 1976 until today, PRT has built its monthly volume from 229 tons of recyclables to more than 800 tons. It has also become especially active in soliciting and receiving several employment and training program grants. Among the programs PRT has been able to use to obtain employees and development money are:

1. **The College Work Study Program:** a Federally funded college employment program which pays 75 percent of the employee's salary while PRT pays the remaining 25 percent.
2. **The Alternative Community Service Program:** a court sponsored alternative service project for first-time misdeameanants.
3. **The Comprehensive Employment and Training Act (CETA) Titles I and II:** a Federally funded job training and employment program which pays the full wages and benefits for the PRT employees. PRT has also received funding under CETA Title VI to give job experience and language training to four Vietnamese refugees.
4. **The Housing and Community Development Agency:** granted money to PRT to refurnish the warehouse and education center and one of the neighborhood centers.

It should be noted that while College Work Study Programs, CETA, and other subsidized employment programs have been very helpful in providing inexpensive labor for PRT activities, these programs do not come without their faults. Since these programs are designed for short term employment, usually 3 to 9 months, there is a high turnover of personnel which results in a substantial burden on PRT management. Frequently, new employees are trained and given break-in experience, only to be lost after a few months when grants and subsidies expire. Additionally, grant programs require a significant amount of management time preparing and writing grant applications and working with the university and government agencies responsible for administering these programs.

These grants and employment programs gave PRT the resources to expand its commercial accounts and education program, and allowed extension of neighborhood projects into two additional communities. They also paved the way for PRT to develop several new projects and areas of activity. For instance, PRT established the Oregon Industrial Waste Information



Exchange under contract to the Oregon Department of Energy.

Overall, the period from 1975 to 1978 saw PRT develop its operations and material-handling capability into an effective business enterprise which is able to offer efficient and dependable service to the community, while remaining a true environmental organization working towards the principles of reuse, waste reduction, and source separation recycling. This effort and commitment has not gone unrecognized as demonstrated by the fact that the Portland Recycling Team was awarded, in 1976, the Cleanup Pollution (CUP) Award from the Oregon Department of Environmental Quality. This was the first time this award went to any solid waste management organization and it marked the arrival of PRT as a major factor and contributor in Oregon's solid waste management future.

As this booklet goes to press, PRT is again faced with financial problems similar to the one experienced in 1974-75. Through good and bad experiences of past years, the recycling team has learned when to utilize any or all economic resources available. So, in addition to having cut back recently on some of its programs and services while remaining true to its goal to be a full-time recycling organization, PRT has called on the public for support in forms of benefits and donations, and it has also appealed to governmental bodies for assistance. PRT's prognosis looks good. The regional planning agency may provide support and local waste haulers are offering assistance. It is likely that PRT will expand their level of support during this process. And they will continue to be an innovative and expanding environmental service as they have for the last decade.

MONTHLY THROUGHPUT: AUGUST 1979
PORTLAND RECYCLING TEAM

Material	Processing	Marketing	Tonnage	Price	Income
Glass Bottles	manually and machine crushed	in drums or 20 cubic yard containers	342	$30/Ton & $45/Ton	$13,620
Newsprint	NONE	in 20 and 30 cubic yard containers	160	$34/Ton	5,440
Corrugated	baled	trucked to broker	76	$65/Ton	4,940
Steel Cans	NONE	in 48 cubic yard containers	24	$33/Ton	792
Aluminum	NONE	in 20 cubic yard containers	22	$600/Ton	13,200
Kraft	baled	trucked to broker	4	$90/Ton	360
Motor Oil	NONE	stored in tanks; collected by processor	400*	$.05/Gallon	20
White Ledger	baled	trucked to broker	23	$115/Ton	2,645
Colored Ledger	baled	trucked to broker	13	$95/Ton	1,235
CPO/Tab	palletized	trucked to broker	17	$210 Ton	3,570
Mixed Wastepaper	NONE	in 10 cubic yard containers	92	$8/Ton	736
			1,173 tons		$46,558

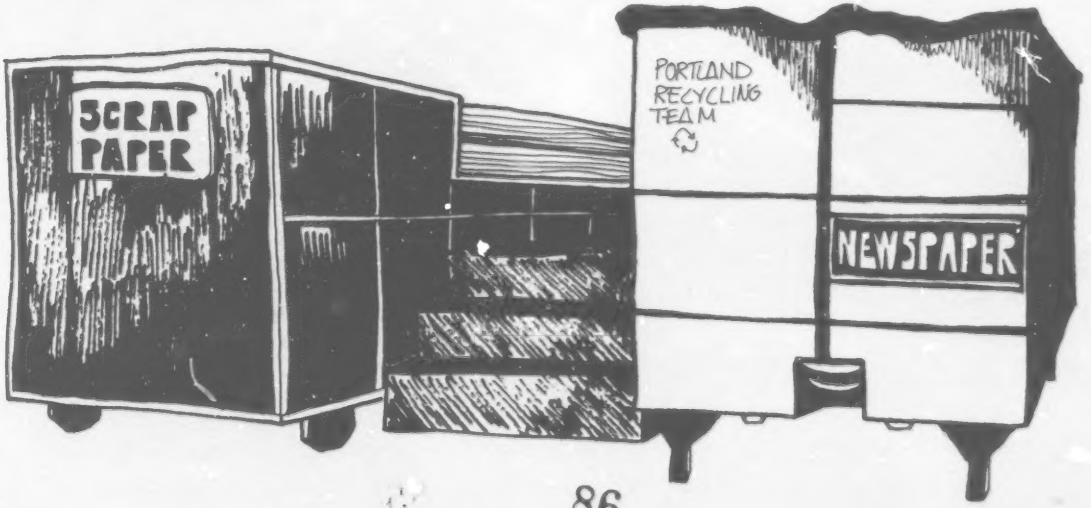
*motor oil sold by the gallon

For more information contact:

Portland Recycling Team
1801 N.W. Irving
Portland, OR 97209

and

Resource Conservation Consultants
1615 N.W. 23rd, Suite One
Portland, OR 97210



VII. ADDITIONAL RESOURCES

The following resources, publications, and films on solid waste and recycling are available to the public.

GENERAL INFORMATION

1. "Solid Waste Publication List," available through the Environmental Action Foundation, Dupont Circle Building, Suite 724, Washington, D. C. 20036. Lists solid waste newsletters, national publications, and solid waste magazines or technical journals. Lists the addresses, cost of subscriptions, and brief abstracts as to what the publications write about and the audience it is written for. Free.

2. "National Solid Waste Organizations," available through the Environmental Action Foundation (see Number 1). Lists names, addresses, and phone numbers of national public interest groups connected with solid waste, and national solid waste trade organizations. Free.

3. "Solid Waste Resource Guide," available through the Environmental Action Foundation (see Number 1). Lists many books, pamphlets, packets and educational tools for people working on solid waste issues. Most of the materials are recent and represent some of the best resources available on solid waste issues. This publication lists numerous resources including information on: Recycling Centers, Resource Recovery, Source Separation, Solid Waste/Environmental Education, Media, Beverage Container Deposit Legislation, and other issues.

4. "Available Information Materials on Solid Waste Management," available through Solid Waste Information, U. S. EPA, Cincinnati, Ohio, 45268. Lists publications and background readings in Waste Reduction, Packaging and Beverage Containers, Recycling and Source Separation, Resource Recovery, Solid Waste Legislation, and Films and Slide Shows. Publication Number 203. Free.

5. "National Solid Waste Resource Persons List," available through the Environmental Action Foundation (see Number 1). Lists experts on various solid waste issues. Includes economists, planners, recyclers, engineers, etc.

6. "Waste Materials: Recycling and Reuse," available through the Library of Congress, Congressional Research Service, Major Issues System, Room 126A, Washington, D. C. 20540. Lists background and policy analysis papers on recycled materials use.

7. "Community Recycling: An Alternative to Disposal," available through the Department of Ecology, State of Washington, Olympia, Washington 98504.

8. "Recycling in Your Community, What State and Local Officials Can Do to Make Recycling More Effective," available through the National Association of Recycling Industries, 330 Madison Avenue, New York, New York 10017.

9. "Recycling and the Consumer," available through the U. S. Environmental Protection Agency, Publication Number SW-117.

10. "Recycle: In Search of New Policies for Resource Recovery," available through the League of Women Voters Education Fund, 1730 M Street, N.W., Washington, D.C. 20036.

11. "Fourth Report to Congress: Resource Recovery and Waste Reduction," available through the U.S. Environmental Protection Agency, Publication Number SW-600. Chapter Four reviews EPA source separation programs.

12. "Good News in Garbage," by Mark Sullivan, available through the Solid Waste Project, National Wildlife Federation, 1412 16th Street, N.W., Washington, D.C. 20036.

13. "Recycling as an Approach to Solid Waste Management in New Hampshire," by R.L. Tichenor and E.F. Jansen, Jr., available through Recycling and Conservation Inc., P.O. Box 276, Kittery, Maine 03904.

14. "Curbing Trash — A Community Guide to Curbside Recycling Collection Programs," available through the League of Women Voters, Publication Number 147 (see Number 10).

15. "The Little Town That Could," by Mark Sullivan, available through the National Wildlife Federation (see Number 13). This is a description of a rural recycling project in Nottingham, New Hampshire.

16. "Residential Paper Recovery: A Municipal Implementation Guide," available through the U.S. Environmental Protection Agency, Publication Number SW-486.

17. "Market Locations for Recovered Materials," available through the U.S. Environmental Protection Agency, Publication Number SW-518.

18. "Paper Stock Standards and Practices," available through the Paper Stock Institute of America, 330 Madison Avenue, New York, New York 10017. Information on types of paper stock and techniques of upgrading paper for marketing.

19. "Safety Manual for Recyclers," available through the Association of Oregon Recyclers, 1615 N.W. 23rd Avenue, Portland, Oregon 97210.

20. "Multimaterial Source Separation in Marblehead and Somerville, Massachusetts," available through the U.S. Environmental Protection Agency, 5 volumes:

- I: The Community Awareness Program in Somerville and Marblehead, Massachusetts (SW-551).
- II: Collection and Marketing (SW-822).
- III: Composition and Source-Separated Materials and Refuse (SW-823).
- IV: Energy Use and Savings from Source-Separated Materials and Other Solid Waste Management Alternatives for Marblehead (SW-824).
- V: Citizen Attitudes Toward Source Separation (SW-825).

21. "The Whys and Hows of Public Service Announcements," available through the National Citizens Committee for Broadcasting, Suite 415, 1346 Connecticut Avenue, N.W., Washington, D.C. 20036.

22. "Breaking Into Broadcasting," available through the League of Women Voters, Publication Number 586 (see Number 10).

23. "Getting Into Print," available through the League of Women Voters, Publication Number 484 (see Number 10).

24. "Projecting Your Image, How to Produce a Slide Show," available through the League of Women Voters, Publication Number 296 (see Number 10).

25. "If You Want Air Time," available through the National Association of Broadcasters, 1771 N Street, N.W., Washington, D.C.

26. "Films from EPA," available through the Office of Public Affairs (A-107), U.S. Environmental Protection Agency, Washington, D.C. 20460.

27. "How to Use the Recycling Equipment Investment Tax Credit," available through the Association of Oregon Recyclers, 1615 N.W. 23rd Avenue, Portland, Oregon 97210.

28. "Resource Recovery and Waste Reduction Activities: A Nationwide Survey," available through the U.S. Environmental Protection Agency, Publication Number SW-432a.

29. "Energy Savings from Recycling," available through Resource Conservation Consultants, 1615 N.W. 23rd, Portland, Oregon 97210.

30. "Beverage Containers: The Vermont Experience," available through U.S. Environmental Protection Agency, Publication Number SW-139.

31. "Choices for Conservation: Resource Conservation Committee Final Report to the President and Congress," available through U.S. Environmental Protection Agency, Publication Number SW-779.

32. "Let's Recycle: A Teacher's Guide to Recycling: Lesson Plans for Grades K-6 and 7-12," available through U.S. Environmental Protection Agency, Publication Number SW-801.

33. "Residential Paper Recovery: A Community Action Program," available through U.S. Environmental Protection Agency, Publication Number SW-553.

34. "Paper Profits: Solid Waste Project," available through U.S. Environmental Protection Agency, Publication Number SW-666.

35. "What You Can Do To Recycle More Paper," available through U.S. Environmental Protection Agency, Publication Number SW-446.

36. "Waste Not, Want Not" (poster), available through U.S. Environmental Protection Agency, Publication Number SW-313.

37. "Use It Again Sam: The Federal Office-Paper Recycling Program," available through U.S. Environmental Protection Agency, Publication Number SW-616.

INFORMATION SOURCES

1. The Aluminum Association
   818 Connecticut Avenue N.W.
   Washington, D.C. 20006
2. American Paper Institute
   260 Madison Avenue
   New York, New York, 10016
3. American Public Works Association
   Institute for Solid Waste
   1776 Massachusetts Avenue N.W.
   Washington, D.C. 20036
4. Glass Packaging Institute
   1800 K Street N.W.
   Washington, D.C. 20006
5. Institute of Scrap Iron and Steel
   1627 K Street N.W.
   Washington, D.C. 20006
6. International City Management Association
   1140 Connecticut Avenue N.W.
   Washington, D.C. 20036
7. National Association of Counties
   1735 New York Avenue N.W.
   Washington, D.C. 20006
8. National Association of Recycling Industries
   330 Madison Avenue
   New York, New York, 10017
9. National Center for Resource Recovery
   1211 Connecticut Avenue N.W.
   Washington, D.C. 20036
10. National Solid Waste Management Association
    1120 Connecticut Avenue N.W.
    Washington, D.C. 20036
11. National Governors Association
    444 North Capitol Street
    Washington, D.C. 20001
12. U.S. Environmental Protection Agency
    Office of Solid Waste
    401 M Street, S.W.
    Washington, D.C. 20460
13. U.S. Environmental Protection Agency
    Office of Public Information
    26 West St. Clair Street
    Cincinnati, Ohio 45268
14. National Technical Information Service
    U.S. Department of Commerce
    5285 Port Royal Road
    Springfield, Virginia 22161

VIII. GLOSSARY

1. **ALUMINUM:** A silvery-white metallic element, the most abundant in the earth's crust. It is used to form many hard, light, corrosion-resistant alloys.

2. **BACK-END LOADER:** A refuse truck which has power driven loading equipment at the rear of the vehicle.

3. **BALER:** A machine in which waste materials are compacted to reduce volume, usually into rectangular bundles.

4. **BI-METAL CAN:** A can made from two or more metals, usually steel or tin and aluminum.

5. **BIODEGRADABLE MATERIALS:** Waste material which is capable of being broken down by bacteria into basic elements. Most organic wastes such as paper and food remains are biodegradable.

6. **BOXBOARD:** Paper used in the manufacturing of cartons and rigid boxes.

7. **BROKE:** Paper that has been discarded anywhere in the manufacturing process. It is usually returned to a repulping unit for reprocessing.

8. **CLASSIFICATION:** to arrange or sort waste materials into uniform categories or classes, usually by size, weight, color, organic/inorganic, etc.

9. **COLLECTION:** The act of picking up waste materials at homes, businesses, or industrial sites, and hauling it to a facility for further processing, transfer to larger vehicles or disposal.

10. **COLLECTION CENTER:** A facility designed to accept materials from individuals, usually for recycling.

11. **COMMERCIAL WASTE:** Waste material which originates in wholesale, retail or service establishments such as office buildings, stores, hotels, universities, and warehouses.

12. **COMPACTOR:** Any power-driven mechanical equipment designed to compress and reduce the volume of waste materials.

13. **COMPACTOR TRUCK:** A large truck with an enclosed body having special power-driven equipment for loading and compressing waste materials.

14. **COMPOSTING:** A solid waste management technique which utilizes natural processes to convert most organic materials to humus by micro-organism activity.

15. **CONSTRUCTION WASTE:** Waste material produced in the construction of homes, buildings, industrial plants, etc. The materials usually include lumber, metal parts, sheet rock, etc.

16. **CONVEYOR:** A mechanical device used to move materials between operations. Conveyors are used to move waste materials at collection centers, transfer stations and resource recovery plants.

17. **CORRUGATED:** Used as a noun the term refers to a structural paper material shaped in parallel furrows and ridges for rigidity.

18. **CRUSHER:** A mechanical device used to break up waste materials into smaller sized pieces.

19. **CULLET:** Scrap glass, usually broken up into small, uniform pieces.

20. **DEINKING:** A process in which most of the ink, filler and other extraneous material is removed from printed waste paper. This produces pulp which can be used along with varying percentages of virgin paper in the manufacture of new paper.

21. **DUMP:** An open land site where waste materials are burned, left to decompose, rust or simply remain. Because of the problems which dumps create such as air and water pollution, unsanitary conditions and general unsightliness, dumps have been declared illegal in many states.

22. **ECOLOGY:** The science of the relationship between organisms and their environment.

23. **ENERGY RECOVERY:** A form of resource recovery in which the organic fraction of waste is converted to some form of usable energy.

24. **ENVIRONMENT:** The air, the water and the earth, sometimes called the biosphere.

25. **ENVIRONMENTAL PROTECTION AGENCY (EPA):** An agency of the Federal government responsible for the establishment and enforcement of environment protection standards.

26. **FERROUS METALS:** Metals which are predominantly composed of iron. Most ferrous metals are magnetic.

27. **FRONT-END LOADER:** A refuse truck which has power driven loading equipment at the front of the vehicle.

28. **GARBAGE:** Waste materials which are likely to decompose or putrefy. Usually contains food waste from a kitchen, restaurant, slaughter house or food processing plant.

29. **GLASPHALT:** A trade name for a highway paving material in which recovered ground glass replaces some of the gravel normally used in asphalt.

30. **GLASS:** A material made from the fusion of sand and soda ash, with other ingredients. Common glass is impermeable, transparent, sanitary and odorless. Bottle glass is made basically by melting sand in furnaces at 2700°F with burnt lime of limestone and soda ash.

31. **HAMMERMILL:** A type of crusher used to break up waste materials into smaller pieces or particles, which operates by using rotating and flailing heavy hammers.

32. **HAZARDOUS WASTE:** A solid waste that may cause or significantly contribute to serious illness or death, or that poses a substantial threat to human health or the environment when improperly managed.

33. **HOME SCRAP:** Scrap that is utilized within the plant where it originates.

34. **HYDRAPULPER:** A tradename for a large mechanical device used primarily in the paper industry to pulp waste paper or wood chips and separate foreign matter. The effect of pulping is to suspend finely divided cellulose fibers in water.

35. **INCINERATOR:** A plant designed to reduce waste volume by combustion.

36. **INDUSTRIAL SCRAP:** Waste which is generated during a manufacturing operation. (See In-Plant Waste.)

37. **INDUSTRIAL WASTE:** Those waste materials generally discarded from industrial operations or derived from manufacturing processes.

38. **INORGANIC REFUSE:** Waste material made from substances composed of matter other than plant, animal, or certain chemical compounds of carbon.

39. **IN-PLANT WASTE:** Waste generated in manufacturing processes. Such might be recovered through internal recycling or through a salvage dealer.

40. **JUNK:** Waste materials such as rags, paper, metals, broken furniture, toys, equipment, etc. The term usually implies that the materials can be recovered or converted for reuse.

41. **KRAFT PAPER:** A comparatively coarse paper particularly noted for its strength and made primarily from wood pulp produced by the sulfate pulping process.

42. **LEACHATE:** A liquid containing decomposed waste, bacteria and other noxious and potentially harmful materials which drains from landfills and must be collected and treated so as not to contaminate water supplies.

43. **LITTER:** Solid waste discarded outside the established collection disposal system, such as on streets, in parks or along roadsides.

44. **MAGNETIC SEPARATOR:** Equipment usually consisting of a belt, drum or pulley with a magnet used to attract and remove magnetic materials from other materials.

45. **METHANE:** An odorless, colorless, flammable gas which is formed by the anaerobic decomposition of organic waste matter or by chemical synthesis.

46. **MIXED PAPER:** Waste paper of various kinds and quality usually collected from stores, offices and schools.

47. **MOLDED PULP PRODUCTS:** Contoured fiber products molded from pulp for such uses as egg packaging, trays for fresh meat plates and protective packaging.

48. **MUNICIPAL WASTE:** Solid waste materials generated by residential, industrial, or commercial sources but not including hazardous or demolition waste materials.

49. **NEWSPRINT:** The kind of paper generally used for printing newspapers.

50. **NON-FERROUS METALS:** Metals which contain no iron such as aluminum, copper, brass, bronze, etc.

51. **OBSOLETE SCRAP:** Scrap material derived from products which have completed their useful economic life.

52. **OPEN BURNING:** The burning of waste materials in the open or in a dump. Open burning produces smoke, odor, and other objectionable air pollutants.

53. **PACKAGING MATERIALS:** Any of a variety of papers, cardboards, metals, wood, paperboard and plastics used in the manufacture of containers for food, household, or industrial products.

54. **PAPER:** A thin sheet material made of cellulose pulp, derived mainly from wood, rags, and certain grasses, processed into flexible leaves or rolls by deposit from an aqueous suspension, used chiefly for writing, printing, wrapping and sanitary purposes.

55. **PAPERBOARD:** Heavier in weight, thicker, and more rigid than paper. There are three basic classes of paperboard: 1) container board; 2) boxboard; and 3) special types such as automobile board, building board, etc.

56. **PAPERSTOCK:** A general term used to designate waste papers which have been sorted or segregated at the source into various grades.

57 **PLASTICS:** Man-made materials consisting of large molecules called "polymers" containing primarily carbon and hydrogen with lesser amounts of oxygen or nitrogen, frequently compounded with various organic and inorganic compounds as stabilizers, colorants, fillers and other ingredients.

58. **POST-CONSUMER SCRAP:** Any uncontaminated packaging material that is recoverable such as tin cans, egg cartons, glass bottles and jars.

59. **PRIMARY MATERIALS:** Virgin or new materials used for manufacturing basic products, such as wood pulp, iron ore, silica sand and bauxite.

60. **PULP:** Fiber material that is produced by chemical or mechanical means from fibrous cellulose raw material and from which paper and paperboard are made.

61. **PYROLYSIS:** The process of chemically decomposing an organic substance by heating it in an oxygen-deficient atmosphere. High temperatures and closed chambers are used. The major products from pyrolysis of solid waste are water, carbon monoxide, and hydrogen. Some processes produce an oil-like liquid of undetermined chemical composition. The gas may contain hydro-carbons and frequently there is process residue of a carbon char. All processes leave a residue of inorganic material. The gaseous products cannot be mixed with natural gas in principal distribution systems unless there is additional chemical

processing. Applied to solid waste, pyrolysis has the features of effecting major volume reduction while producing storable fuels.

62. **RECLAMATION:** The restoration to usefulness or productivity of materials found in the waste stream. These reclaimed materials may be used for purposes which are different from their original use.

63. **RECYCLING:** A resource recovery method involving the collection and treatment of a waste product for use as a raw material in the manufacture of the same or a similar product.

64. **REFUSE-DERIVED FUEL (RDF):** The combustible or organic fraction of municipal solid waste which has been prepared for use as a fuel by any of several mechanical processing methods.

65. **RESIDENTIAL WASTE:** Waste materials generated in houses and apartments. The materials include paper, cardboard, beverage containers, food cans, plastics, food wastes, glass, garden and yard wastes.

66. **RESOURCE RECOVERY:** A term describing the extraction and utilization of materials and values from the waste stream either as materials which can be used as "raw materials" in the manufacture of new products, or as values which can be converted into some form of fuel or energy source.

67. **REUSE:** The use of a waste material or product more than once.

68. **ROLL-OFF TRUCK:** A truck which deposits and collects a 10 to 50 cubic yard container at a site; generally employed in industrial waste collection systems.

69. **RUBBISH:** A general term for solid waste that does not contain food waste.

70. **SALVAGE:** The extraction of materials from the waste stream for reuse.

71. **SANITARY LANDFILL:** A method of disposing of refuse on land without creating hazards to public health or safety.

72. **SCRAP:** Waste material which is usually segregated and suitable for recovery or reclamation, often after mechanical processing.

73. **SECONDARY MATERIALS:** All types of materials handled by dealers and brokers that have fulfilled their useful function and usually cannot be used further in their present form or at their present location, and materials that occur as waste from the manufacturing of conversion of products.

74. **SHREDDER:** A mechanical device used to break up waste materials into smaller pieces by tearing and impact actions.

75. **SIDE-LOADER:** A refuse truck in which solid waste is loaded into the side of the vehicle.

76. **SOLID WASTE:** Any garbage, refuse, certain sludges and other discarded material, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining, agricultural operations, and from community activities.

77. **SOLID WASTE MANAGEMENT:** The overseeing and regulation of the entire process of generation, storage, collection, transportation, processing, reclamation, and disposal of refuse.

78. **SOURCE SEPARATION:** The setting aside of recyclable waste material at the point of generation

79. **STEEL:** Any of various hard, strong, durable, malleable alloys of iron and carbon, usually containing between 0.2 and 1.7 percent carbon, often with other constituents such as manganese, nickel, copper, tungsten, cobalt, or silicon, and widely used as a structural material.

80. **TIN:** A silvery metallic element obtained chiefly from cassiterite, used mostly to coat other metals to prevent corrosion and form parts of numerous alloys.

81. **TIN CAN:** Essentially a steel can with a tin (approximately .0015 inch) coating. This tin represents one-third of the recycled value of the can while comprising only .25 to .4 percent by weight.

82. **TRANSFER STATION:** A place or facility where waste materials are taken from smaller collection vehicles and placed in larger transportation trucks or barges for movement to disposal areas, usually landfills.

83. **USED MOTOR OIL:** Any oil previously used in any machinery. Its main markets are in road oiling, industrial fuel and rerefining.

84. **TRASH:** Waste materials which usually do not include garbage but may include other organic materials, such as plant trimmings.

85. **VIRGIN MATERIALS:** Any basic material for industrial processes which has not previously been used: trees, iron ore, sand, crude oil, etc.

86. **VOLUME REDUCTION:** The processing of waste materials so as to decrease the amount of space the materials occupy, usually by either: 1) mechanical (crushing or shredding); 2) thermal (incineration or pyrolysis); or 3) biological (composting) processing.

87. **WASTE REDUCTION:** The prevention of waste at its sources, either by redesigning of products or by otherwise changing societal patterns of production and consumption.

88. **WOOD PULP:** The primary material from which most papers are made. It is made of small, loose wood fibers mixed with water.

U.S. Environmental Protection Agency
Regional Offices

Region 1
Solid Waste Program
John F. Kennedy Building
Boston, MA 02203
617-223-5775

Region 2
Solid Waste Section
26 Federal Plaza
New York, NY 10007
212-264-0503/4/5

Region 3
Solid Waste Program
6th and Walnut Streets
Philadelphia, PA 19106
215-597-0980

Region 4
Solid Waste Section
345 Courtland Street, NE.
Atlanta, GA 30308
404-881-3016

Region 5
Solid Waste Program
230 South Dearborn Street
Chicago, IL 60604
312-353-2197

Region 6
Solid Waste Section
1201 Elm Street
First International Building
Dallas, TX 75270
214-767-2645

Region 7
Waste Management Section
324 East 11th Street
Kansas City, MO 64108
816-374-3307

Region 8
Solid Waste Section
1860 Lincoln Street
Denver, CO 80203
303-837-2221

Region 9
Solid Waste Program
215 Fremont Street
San Francisco, CA 94105
415-556-4606

Region 10
Solid Waste Program
1200 6th Avenue
Seattle, WA 98101
206-442-1260

A National Network of Citizens Concerned with Solid Waste Management

WASTE ALERT!

Through a series of conferences and workshops, EPA's Office of Solid Waste is sponsoring a nationwide information program for citizen leaders and decisionmakers in government, industry, business, and education. The goal of **Waste Alert!** is to build understanding of solid and hazardous waste management issues — and the legislation that addresses those issues — to enable these constituencies to participate effectively in programs at the national, State, and local levels.